CoAD_NAAB APR Review_ADDENDA

21 January 2022

Progress Since the Previous Visit

Program Response to Conditions Not Met (See Guidelines)

Exact text quoted from the most recent VTR [2014] on Conditions Not Met

1. **Conditions Not Met [VTR 2014]**

   B.3.Sustainability - B Arch

   B.4.Site Design - B Arch

   B.7.Financial Considerations - B Arch, M Arch

   C.1.Collaboration- B Arch

B. 3. **Sustainability**: *Ability* to design projects that optimize, conserve, or reuse natural and built resources, provide healthful environments for occupants/users, and reduce the environmental impacts of building construction and operations on future generations through means such as carbon-neutral design, bioclimatic design, and energy efficiency.

B. Arch

[X] Not Met

2014 Team Assessment: 8.3. Sustainability is Not Met in the B. Arch program. The Team could find no evidence in classroom exercises or studio projects that reflect the student's ability to design projects utilizing sustainable principals

B.3. B.Arch.:

Design Studios: ARCH 2500, 2501, 3500, 3501, 4510; and Technology Courses: 2327, 2328, 3327, 3328, 4327, 4373 include Sustainable principles in different aspects and instruction formats.

ARCH 2500 – Design Studio III introduces Sustainability issues through initial discussions about passive systems, orientation and form. This studio courses aligns with ARCH 2327 -Technology I, where a comprehensive review

of building technology introduces the role of technology on achieving sustainable design principles. Lectures/discussions of Sustainable Principles are delivered in ARCH 2500 -Design Studio III, in addition to the studios' incorporation of passive strategies into the design work and precedent analysis in ARCH 2327 Technology I.

ARCH 2501- Design Studio IV, elaborates 1 lecture of Ecological Knowledge and Responsibility in addition to and Studio labs discussions and project restrictions.

ARCH 3500- Design Studio V bases the Project Problem in sustainable principles (Fall20 and Fall 21- program Recycling Plant) and the ethics of material recycle and architecture. In addition, there is scheduled a dedicated lecture and discussion of Ecological Knowledge and Responsibility that extends the semester topic into theoretical lines of investigation. (See ARCH 3500 Syllabus)

ARCH 3501- Design Studio VI provides 1 lecture – of Ecological Knowledge and Responsibility in addition to Sustainable principles that are expected as base response since courses accumulate previous courses learning outcomes.

B. 4. Site Design: *Ability* to respond to site characteristics such as soil, topography, vegetation, and watershed in the development of a project design.

B. Arch

[X] Not Met

2014 Team Assessment: B.4. Site Design is Not Met in the B. Arch program. The Team could find no evidence in classroom exercises or studio projects that reflect the student's ability to respond to projects situated on sites with varying site conditions.. As noted in the Team's comments under criterion 8.2. Accessibility, students were not exposed to site diversification and were consequently lacking in their skills to resolve the myriad of issues associated with sites of varying topography.

B.4. B.Arch.:

Site Design is integrated into more courses, including ARCH 2500, 2501, 3500, 3501, and 4510. Working with various topographies, access is emphasized, sustainability topics were added, and the problems of vegetation and drainage have been better emphasized. Particularly ARCH 3500 – Design Studio V dedicate 4 weeks of the semester to develop

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a site analysis and representation in depth and midterm reviews assess the relationship between input and impact into the design response.

B. 7 Financial Considerations: *Understanding* of the fundamentals of building costs, such as acquisition costs, project financing and funding, financial feasibility, operational costs, and construction estimating with an emphasis on life-cycle cost accounting.

B. Arch

[X] Not Met

2014 Team Assessment: B.7. Financial Considerations is Not Met in the B. Arch program. The Team could find no evidence in course studies or the student studio projects that reflected an understanding of the fundamentals of building costs, such as acquisition costs, project financing and funding, financial feasibility, operational costs, and construction estimating with an emphasis on life-cycle cost accounting. The course syllabus for ARCH 4360 - Technology 6 includes relevant content and faculty provided lectures associated with content when requested; however, the Team could find no work product or examination content providing evidence of student understanding.

B.7. B.Arch.:

Introduction of financial consideration sections into ARCH 4510, Integrated Architectural Solutions.

Special attention has been paid since the last accreditation visit to make sure students have a better understanding of the fundamentals of building costs and financing practices.

In the Bachelor of Architecture program, a Financial Considerations Workshop has been incorporated into ARCH 4510: Integrated Architectural Solutions Studio as one of the presentations and accompanying exercises required for every student in the course (and thereby required of every student receiving this degree). The Financial Considerations presentation provides an overview of the factors that influence a project's cost, including land value, development (soft) costs such as professional fees, financing, testing, permitting, and hard costs associated with materials, procurement, and labor. The students, using their 4510 studio project as subject, are assigned two types of financial consideration exercises: one that estimates the project cost on a per/sq ft basis using two different methods, and another exercise that estimates the cost of the building envelope based on the costs of labor and materials that make up the envelope components. For the second exercise, the students are performing this estimate using two different assemblies for comparison.

M. Arch

[X] Not Met

2014 Team Assessment: 8.7. Financial Considerations is Not Met in the M. Arch program. The Team could find no evidence in course studies or the student studio projects that reflected an understanding of the fundamentals of building costs, such as acquisition costs, project financing and funding, financial feasibility,

operational costs, and construction estimating with an emphasis on life- cycle cost accounting. Consultation with faculty confirmed that the required Financial Considerations content and criteria was not explicitly addressed in any other course that ARCH 6360 - Practice of Architecture for all tracks within the M Arch program. There is strong evidence of financial issues within the Track I Design-Build Studio curriculum; however, the Design-Build Studio is only required for Track I students.

B.7. M.Arch.:

Introduction of financial consideration sections into ARCH 6393, Master's Project Preparation.

Since the last accreditation visit, special attention has been paid to ensure students have a better understanding of the fundamentals of building costs and financing practices.

In the Master of Architecture program, Financial Considerations Workshops have been incorporated into two courses required of every student receiving this degree—ARCH 6604: Architecture Design Studio IV and 6393: Master Project Preparation.

All students enrolled in ARCH 6393 must complete an estimate for both the land acquisition costs and preliminary construction costs of their self-selected Master Project. This costing exercise is a required part of their Master Project prospectus.

ARCH 6603 also includes exercises that cover financial aspects.

ARCH 6604 RL Financial Considerations

C. 1. Collaboration: *Ability* to work in collaboration with others and in multi-disciplinary Teams to successfully complete design projects.

B. Arch

[X] Not Met

2014 Team Assessment: C.1. Collaboration is Not Met in the B. Arch program. The Team could find no evidence in course studies or the student studio projects that indicated students were required to work together as a team to successfully complete a studio design project. Students indicated that they gave and received assistance from their colleagues on an informal basis; however, there was no evidence that collaboration was a structured component of the B Arch curriculum.

C.1. B.Arch.:

Integrated into ARCH 4510, with teams of students working on projects; additionally, in the Technology classes and the Professional Practice course, ARCH 4328.

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A redistribution of SCs has been implemented. The SCs are now spread more broadly across courses.

The reorganization of the Technology courses has been initiated and is in progress.

Program Response to Causes of Concern

2. Causes of Concern [VTR 2014]

a) Site Accessibility:

While the Team found that the program had made great strides within the physical building in resolving the Accessibility "Not Met" criterion from their 2008 accreditation visit, evidence of the ability to resolve site accessibility remains weak. The majority of studio projects were situated on flat sites, essentially devoid of topographical considerations. The Team had great difficulty determining if students were able to resolve the difficulties of ramping and other accessibility issues associated with site design. During discussions students acknowledged they had little experience dealing with site accessibility concerns. This applies to both the B. Arch and M. Arch programs.

b) Applied Research:

Research skills were evident in student work; however, the level of understanding of the information was not evident. With immediate access to information on the web, students easily cut and paste information, pictures, and graphs that are appropriate to their research but do not show evidence they understand how the information correlates to their specific tasks or informs their design decisions. The Team is also concerned that information accessed from the web was not given appropriate credit for the source making it difficult for the Team to determine original student research and design from data pulled from reference sources.

c) Requirements of IDP:

There was little evidence that students were broadly aware of the requirements of IDP and even less evidence within the faculty. The requirements of IDP have changed significantly in recent years. When questioned, only the leadership of the various student organizations seemed to be aware of these changes. All students need to be made aware of IDP, its significance to licensing, and how they can begin in school to earn their credits.

Compliance with the Conditions for Accreditation

1 – Context and Mission

2- Shared Values of the Discipline and Profession

3 – Program and Student Criteria

3.1 PC 1 – Career Paths

Patrick Peters, Architect, NCARB, the faculty Architect Licensing Advisor, working in collaboration with Kim Saotonglang, student Licensing Advisor, provided two "path to licensure" workshops for all students within the programs—one in the early fall targeting entering and early year students, and one later in the fall targeting exiting students. Kim Saotonglang traveled to Miami to attend the NCARB 2021 Licensing Advisors Summit in person while Professor Peters followed it virtually.

Participation and performance on the Architect Registration Exam (ARE) are indicators of the College's success in encouraging students to pursue the path to licensure. The Office of the Dean and the Architect Licensing Advisor monitors the ARE success rate in Texas and sets a benchmark to match the statewide average pass rate in three years. This will be assessed with the release of the pass rates each fall.

The UH Architecture Alumni organize an annual Career Fair and hold it in the College's atrium each spring (pre-pandemic). Graduating students from both programs participate to gain experience interviewing and to secure professional employment. Participating firms include small and large architectural practices, but also non-architectural organizations as well, showcasing the range of employment options and career paths available. The Office of the Dean and Architecture Alumni set a benchmark to secure participation from 20 firms and post-graduation employment for 50% of the graduating students. This will be assessed in the fall of each year.

Courses:
The following courses address Career Paths

BARCH
ARCH 1358 – Introduction to Design Culture
ARCH 4328 – Technology 6

MARCH
ARCH 6360 – Professional Practice

Approach
In the B.Arch:

ARCH 1358 - Introduction to Design Culture

In the B.Arch program, the opening module of the required course ARCH 1358 Introduction to Design Culture—taken by all first-year B.Arch majors in their first semester—includes an in-depth discussion of professional career paths in architecture and the question of "who designs"—who has access (and who historically has not) to the study and practice of the design professions, including an overview of degree types and costs, paths to licensing and their costs, inclusion and equity, and historical barriers to the pursuit of design careers with regard to race, gender, and disability. These issues are explored through lecture materials, required weekly readings, and in-class discussion in small class groups through which students' understanding of and responses to these issues can be assessed by the Instructional Assistants. In Fall 2021, lecture

content and readings covered the *Inclusion in Architecture* (2015) report of The J. Max Bond Center on Design for the Just City, which provides detailed data on the state of the profession and the academy, including costs and timeframes for licensure, salary ranges for professional practice, and lengths and types of various undergraduate and graduate degree paths to professional practice. Students also read and discussion selections from the ACSA "Where Are My People?" research series (2020–21) which examines inclusion and access to professional careers for underrepresented groups (including women, Black, Hispanic and Latinx, Asian American, Native Hawaiian, and Pacific Islander, Native American, First Nations and Indigenous, and Middle Eastern and Northern African practitioners) along with additional readings on barriers to access for women and disabled architects and students.

The opening module of ARCH 1358 also features an in-depth discussion of different definitions of "design" and of "design practice," including an exploration of the multiple career options and opportunities that emerge from an understanding of design as an attitude versus an understanding of design as a profession. These issues are explored through lecture materials, required weekly readings, and in-class discussion of alternative models of architectural practice that utilize the discipline's skills and knowledge, combined with an introduction to significant examples of expanded or multidisciplinary design practice, including Charles and Ray Eames and Laszlo Moholy-Nagy. Students also explore and discuss the wide range of skills and knowledge needed to practice architecture, primarily through a detailed analysis of Michael Sorkin's ""Two Hundred Fifty Things Every Architect Should Know" (2018), along with statements on the skills, process, and attitudes needed for design practice by key designers including Charles Eames, Milton Glaser, and Corita Kent.

ARCH 4360 - Technology 6

In ARCH 4360 Technology 6, a required course taken by all B.Arch students near the end of their curriculum, course instructors and guest architects present a licensing path overview and an explanation of career alternatives as part of the orientation to and analysis of professional practice.

In Spring 2022, the "Path to Licensing" workshops will be delivered in ARCH 4360 to ensure that all students have received that information and will understand the steps necessary to become a licensed architect and the possible career alternatives that architecture degree holders can pursue.

Assessment and Benchmarks

Assessments for ARCH 1358 consist primarily of weekly quizzes and three longer exams that emphasize students' retention of the broader ideas and concepts under discussion, as well as the specific data (people, places, dates, and events) through which we understand the history of architecture and urbanism. Weekly written responses and active participation in weekly discussion groups are used to assess students' coverage and understanding of the weekly course content, which includes lectures, readings, films, and/or podcasts. In Fall 2021, 92% of the class (239 students) earned a C/75 or better course grade; 88% of the class earned a B/85 or better course grade, and 69% earned an A-/90 or better. The average course grade was 89/B+ and the median course grade was 92/A-. On Exam 1—written to assess students' understanding of the course's opening module on professional career paths and the skills and knowledge required for the study and practice of design—96% of students earned a C/75 or better.

Assessment for ARCH 4360 will include a graded quiz at the end of class that assesses the students' understanding of the architects' paths to licensure and the range of possible career paths. The benchmark for this assessment is that 80% of the students should earn a 75% or better.

In each course, the rubrics containing the following questions (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations.

This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

Initial evaluation points relative to coursework assignments will include:
-understanding of the paths to becoming licensed as an architect in the United States
-understanding of the range of available career opportunities that utilize the discipline's skills and knowledge

In the **M.Arch:**

ARCH 6360 Practice of Architecture

Approach

In ARCH 6360 Professional Practice, a required course taken by all M.Arch. students near the end of their curriculum, course instructors and guest architects present a licensing path overview and an explanation of career alternatives as part of the orientation to and analysis of professional practice.

Assessment for ARCH 6360 will include a graded quiz at the end of class that assesses the students' understanding of the architects' paths to licensure and the range of possible career paths. The benchmark for this assessment is that 80% of the students should earn a 75% or better.

In Spring 2022, the "Path to Licensing" workshops will be delivered in ARCH 6360 to ensure that all students have received that information and will understand the steps necessary to become a licensed architect and the possible career alternatives that architecture degree holders can pursue.

Assessment and Benchmarks

In each course, the rubrics containing the following questions (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch. and M.Arch. degrees respectively.

Initial evaluation points relative to coursework assignments will include:
-understanding of the paths to becoming licensed as an architect in the United States
-understanding of the range of available career opportunities that utilize the discipline's skills and knowledge

3.1 PC 2 – Design

3.1 PC 3 – Ecological Knowledge and Responsibility

SUBMITTED APR TEXT

PC.3 Ecological Knowledge and Responsibility—How the program instills in students a holistic understanding of the dynamic between built and natural environments, enabling future architects to mitigate climate change responsibly by leveraging ecological, advanced building performance, adaptation, and resilience principles in their work and advocacy activities.

PC.3 PROGRAM RESPONSE

Courses included in response to PC.3:

B.Arch

ARCH 2327 – Technology 1
ARCH 2328 – Technology 2
ARCH 3327 – Technology 3
ARCH 3328 – Technology 4
ARCH 2500 – Architecture Design Studio III
ARCH 2501 – Architecture Design Studio IV
ARCH 3500 – Architecture Design Studio V
ARCH 3501 – Architecture Design Studio VI
ARCH 4327 – Technology 5
ARCH 4373 – Urban Environments
ARCH 4510 – Architecture Design Studio VII

M.Arch

ARCH 6A48 – Environmental Tech III
ARCH 6A50 – Construction Technology III
ARCH 6603 – Design Studio III
ARCH 6376 – Urban Determinants
ARCH 6A49 – Environmental Tech IV
ARCH 6A51 – Construction Technology IV
ARCH 6357 – Contemporary Theory and Critical Practice
ARCH 6604 – Design Studio IV

1. PROGRAM APPROACH TO ECOLOGICAL KNOWLEDGE AND RESPONSIBILITY

Ecological Knowledge is central to the ethos of UHCoAD. A fundamental goal of our programs is to instill in our students the values of ecology, equity, social responsibility, and stewardship. All of our projects and research consider questions of sustainability and resilience—with the idea that the built environment is central to the ongoing health and stewardship of our planet.

The drastic impacts of climate change are visible throughout the Gulf Coast region in which our College sits: rising temperatures, increasing storm frequency and volatility, more frequent and severe flooding events. These climatic effects occur in a region with intensive land development, petrochemical industry, and vast surfaces of asphalt and mobility infrastructure. Houston's watersheds, air, and soil quality are impacted by the emissions from a sprawling industrial region called the Houston Ship Channel. These problematic overlaps and tensions between the natural and built environments become the frames through which we approach our studio and lecture courses—encompassing the social, economic, and material realms.

By exploring the relationships between the natural and built environments, the program recognizes the ecological tensions between Houston and the expanded territory of the Gulf Coast. This ecological tension is important as a focus of our architecture studios— how we address it through architectural thinking, and how our design decisions impact the natural environment. This stewardship includes values of equity and social responsibility that appear in the design problems we pose to our students in both studios and seminars. We also have several research entities

engaged in these issues, such as the Community Design Resource Center (CDRC) and the Center for Sustainability and Resilience (CeSaR), which provide our students with opportunities to work with communities directly and pragmatically.

We also strive to make our students aware of industry-standard green building certification and evaluation programs such as LEED, BREEAM, Living Building Challenge, Passivhaus, and WELL Building Standards, among others. We frequently invite experts in these areas to speak to our students, and many of our faculty are LEED-credentialed. Though design standards and certification processes are central to our industry, we also believe in a deeper engagement with ecological thinking at the level of systemic understanding.

UHCoAD's academic areas and studios have adopted these ecological tensions as productive pedagogical frameworks to help students to acquire Ecological Knowledge progressively—from first to fifth years in the B.Arch. program and from first to third years in the M.Arch. program. We are also in the process of re-tooling our four year undergraduate Bachelor in Environmental Design (B.ENVD) to engage directly with questions of ecology and the built landscape.

Both the B.Arch. and M.Arch. Architecture programs recognize that Ecological Knowledge is holistic: its different aspects can be approached through diverse pedagogical formats such as lectures, seminars, elective courses, workshops, projects, and studios. We believe that Ecological Knowledge should be acquired throughout the curriculum, using multiple forms of learning at different speeds. Many aspects of our curriculum already center on ecological knowledge, though our hope is to greatly expand our offerings and collective knowledge in these areas. To that end, our goal is for students to graduate from our programs with an understanding of the following:

- The meaning of ecology.
- The dynamics between built and natural environments.
- The forces that impact global warming
- Climate change factors.
- Adaptation of architecture design to climate.
- Building performance.
- Knowledge of Industry Standard Environmental Performance Tools (LEED, BREEAM, Living Building Challenge, Passivhaus, etc)
- Relationships of site orientation and climate, and sustainable design principles.
- Relationships of building envelope and sustainable design principles.
- Relationships of materials and sustainable design principles.
- Building environmental and climate control systems (HVAC and sustainable design)
- Resiliency principles of architecture.
- Material ecologies of the build environment.
- Material geographies of the build environment.
- Environmental justice.
- Ecological balance.
- Impacts of design decisions on the natural environment.
- Energy models and their relationships with architecture design.
- Impacts on the environment of energy consumption.
- Design strategies for energy optimization.

1.1 Undergraduate B.Arch Program approach to Ecological Knowledge and Sustainability

From the use of abstract tools in the first semester of the first year, to material and constructed forms in the second semester of the third year, the B. Arch. Program educates students to understand the implications of design decisions in the context of materiality, as well as how this materiality is interwoven with the natural and built environments.

Foundation Level

The first year, ARCH 1500 and ARCH 1501, focuses intensively on tools and materiality—opening a line of critical thinking to understand design choices in the context of material behavior. With materiality as the first ecological tool in design practice, this line of inquiry emphasizes the resonance between ideas and reality and the subject and its environment. Foundation Level concludes in the first semester of the second year with ARCH 2500, through exploring the relationships between building and site, where form responds to site as an ecological construct through the design of a small-scale building.

Intermediate Level

Intermediate Level focuses on medium-scale buildings in the urban context of Houston, generating design ideas from the concrete environmental and contextual issues of the studio sites. Flooding, watershed, soil remediation, and air pollution are environmental issues included in the site conditions. The relationships of form, orientation, materiality, climate, and appropriate design responses are introduced in ARCH 2501 at the level of understanding, and in ARCH 3501 at a high level of resolution. From ARCH 2501 to ARCH 3501, projects include building performance, adaptation, and resiliency from introductory principles in the first semester, to high performance in the last semester in coordination with the technology curriculum. ARCH 3500 projects are intensively focused on the ecological relationships between site and building. This central semester of the level site analysis is developed in-depth at the social, economic, ecologic, physical, material, cultural, and infrastructure level to conclude with a project defined at construction scale where the ecological relationships between building and built and natural environments are demonstrated. The programmatic component of the semesteris rooted in the relationships of urban context and ecological response. In Fall 2021, the semester program for all sections was a Recycling Facility for the recycling of different materials. Each faculty member determines the parameters of the project and its recycling type, including paper, plastic, glass, aluminum, steel, etc. A coordinated lecture on Ecological Knowledge is offered by faculty to all studio sections over the semester. Individual studio faculty determine the ecological approach for each section, as well as the modes of response by the students. Results are shared between sections in order to cross-pollinate ideas and approaches from studio to studio, so that students and faculty discuss together and learn from each other.

The third year is the sum of this progress, stressing site analysis, materiality, constructability, and building performance. The Intermediate Level projects celebrate architecture as a nexus of urban systems, a social and territorial condenser, becoming a venue for the consideration and resolution of ecological conflicts.

Comprehensive level / Building Integration

As a cross-section of the state of knowledge within the College, the Comprehensive Level demonstrates the integration of all building systems in a small-scale building, incorporating advanced building performance into a site-specific solution. Energy efficiency, climate change mitigation, material optimization, and appropriateness to the territorial context are imperatives of this studio work. Highly coordinated with technology sequence, ARCH 4510 is the most advanced project in the curriculum in terms ofbuilding performance. ARCH 4327: Technology 5 has six technology components organizing the sustainability content that underlies the course and are reflected in the technical requirements for the ARCH 4510 studio projects:

1. Owner's Program Requirements
2. Site Orientation and Climate (Sustainable Design Principles)
3. Structure
4. Envelope (Sustainable Design Principles)
5. Materials (Sustainable Design Principles)
6. Heating, Ventilation, AC (Sustainable Design Principles)

This assures that all students are instructed in sustainable design principles and are simultaneously applying those principles in the integrative studio. Our benchmark: 75% of the students will have all six aspects including their sustainable design principles illustrated in the comprehensive project book submitted at the end of the ARCH 4510 studio.

Professional Level

As the last level of the studio sequence, the Professional Level expands studio offerings to a wider field of issues.

Topics increasingly include ecological and environmental questions: soil contamination remediation, non-human/human alliances on Texas-specific flora and fauna, and Zero Net: Smart Green City.

1.2 Graduate M.Arch Program Approach to Ecological Knowledge and Sustainability

In the UHCoAD graduate M.Arch program, it is important for students to grasp the implications and impacts of architectural design decisions on their surrounding environment. Our studio courses seek to increase students' understanding of the environmental results of material and energy use choices, embodied energy, life cycle costing, space-making, urban form, and architecture's external impacts. Increasingly, our studios are structured around fundamental ecological concerns such as climate change, decarbonization, holistic/systemic thinking, environmental justice, and the human costs of historical design and material choices. Our technology courses aim to increase students' analytical understanding of building performance issues relative to sustainability and ecological impact. In both our studio and technology courses, we use a wide variety of tools—from the abstract to the concrete—to gauge approaches to the environment. These extend from sketches and drawings to physical models to digital models to energy, shading, material, and other analytical softwares.

ARCH 6603—Contextualization

The first studio of our Level III program, ARCH 6603, is titled "Contextualization" and always addresses broad questions of urbanization and architecture's urban and ecological contexts. Our recent studios have dealt specifically with climate, extreme weather, and water on the Gulf Coast. In Fall 2019 and again in Fall 2021, we sited our projects in New Orleans along the Mississippi River, where students had to incorporate questions of flooding, storms, and the specific ecologies of the region into their designs. The program was designed to switch between normal and crisis modes—to allow for large scale French Quarter programs to operate as cultural centers normally, but also to switch to a storm and flooding refuge during extreme weather events. As a part of the design process, students engaged in analytical exercises to understand local climatic changes and weather events (hurricanes and floods), as well as the social environment (historical questions of environmental justice as in the Lower Ninth Ward and Bywater.) We encourage a broad and holistic understanding of environmental concerns in this semester: how small design choices can sometimes have large impacts.

ARCH 6604—Synthesization

The second studio of our Level III program, ARCH 6604, is titled "Synthesization" and focuses on the design of an integrated building. In this semester, students work through the entire design process from early site and context analysis through the integration of systems and details at the most refined scale. These small- to medium-scale projects demonstrate the incorporation of all building systems, and the analysis of their performance, in a site-specific solution. The result is a "total building." The studio has several components that make up our approach to this project, several of which focus on sustainable building practices specifically:

- Site and Context Analysis (including Climate, Flora, Fauna, Geomorphology, Water)
- Program Requirements and Pre-Design
- Regulatory Requirements (including Land Use, Zoning and Codes)
- Site Orientation and Climate Design Issues
- Structure from Foundation to Roof
- Accessibility
- Life Safety Systems
- Building Envelope (including Materials and Performance)
- Materials (including Embodied Energy and Life Cycle Costing)
- Environmental Control Systems (including Approaches to Shading and Natural Ventilation)
- Energy (including Renewable Energy Sources as a Primary Approach)

Central to our ARCH 6604 studio is a concern with low-carbon design, and with the integration of sustainable systems. We emphasized the use of sustainable energy and environmental control strategies—including passive solar, good daylighting, and natural ventilation—as well as low- or no-carbon materials. Through building modeling in both our studio and tech courses, we optimize building siting and massing to maximize shade, solar efficiency, and airflow. In addition, we discuss the embodied energy of the materials students propose—including the explicit and implicit costs

of common materials such as steel, concrete, and wood that come not only from resource extraction and manufacture, but also from transport, site work, and longevity.

1.3 Ecological Knowledge and Responsibility in Interdisciplinary and Extracurricular Courses Across the B.Arch and M.Arch Programs:

Extracurricular activities are offered for both B.Arch and M.Arch programs simultaneously. Electives courses on environmental and ecological issues are offered through ARCH 3397 and ARCH 6397 courses. The Material Research Center (MRC), led by Ophelia Mantz, offers topics on material ecologies to map the relationships between material, matter, and territories. Daniel Jacobs offers a semester of experimental research seminar interrogating the reciprocal relationship between nature and its constructed image. Matt Johnson's research seminar "Landscape, Ecology, Urbanism" examines the impacts that the materials economy and the built environment of architecture and infrastructure have on ecosystems and the health of the planet.

2. CURRENT ASSESSMENTS AND BENCHMARKS—ECOLOGICAL KNOWLEDGE AND SUSTAINABILITY

Assessment of Ecological Knowledge and Responsibility in B.Arch Program

Context.-
Over the academic years of 19/20, 20/21 and 21/22 the B.Arch Program has changed its assessment routines to the ones stablished before. Grad and Undergrad have collaborated and discuss the best mechanism to do a consistent assessment format for both programs. The new assessment method of UGA has introduced two structural changes:

- 1/ Incorporation of the roll of the external reviewers.
- 2/ Review of complete contents of strategic studio courses by stablishing a series of rubrics per course.

In each course, the rubrics containing the particular focus about the following topics (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 (EXPECTED) or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee for the B.Arch.

Initial evaluation points relative to coursework assignments will include:

- The meaning of ecology.
- The dynamics between built and natural environments.
- The forces that impact global warming
- Climate change factors.
- Adaptation of architecture design to climate.
- Building performance.
- Knowledge of Industry Standard Environmental Performance Tools (LEED, BREEAM, Living Building Challenge, Passivhaus, etc)
- Relationships of site orientation and climate, and sustainable design principles.
- Relationships of building envelope and sustainable design principles.
- Relationships of materials and sustainable design principles.
- Building environmental and climate control systems (HVAC and sustainable design)
- Resiliency principles of architecture.
- Material ecologies of the build environment.
- Material geographies of the build environment.
- Environmental justice.

- Ecological balance.
- Impacts of design decisions on the natural environment.
- Energy models and their relationships with architecture design.
- Impacts on the environment of energy consumption.
- Design strategies for energy optimization.

For the three courses of ARCH 3500, ARCH 3501 and ARCH 4510 assessments are performed at the Midterm Reviews, the Final Reviews and at the assessment's sessions. Midterm Reviews assessment are conducted internally to anticipate and discuss results in preparation of Final reviews. Midterm and Final Reviews are organized as follows:

- The midterm reviews are assessed by internal reviewers. Reviewers are organized as follows: For the Midterm Review, each course section organize a board of reviewers. The reviewer's board is formed by 3 members: 2 internal faculty, one from another section of the same course, another from a different studio-level or academic area, and 1 upper-level student. Rubrics are filled and returned to the faculty for feedback, assessment and data collection.

- Final Reviews are assessed by external reviewers. A reduced number of sections of each course level (ARCH 3500, ARCH 3501 and ARCH 4510) are selected randomly to be reviewed by external reviewers. The external reviewers are expected to return one fulfilled rubric per student/per section. Data is collected and analyzed.

- Assessment sessions. At the end of each semester starting in last Fall 20, all studio faculty meet with the course faculty and present to the rest of the group one high pass, one average and one low pass in addition to the course premise. Meetings have been recorded and share with faculty for consultation since Fall 20. Discussions after presentations help the group to finalize grades having the overview of all similar sections and upper and lower levels.

This process has been developed over the past two and a half Academic Years. Rubrics have been discussed and progressively implemented in the course schedules but assessment has not been not fully completed as described above for each semester.

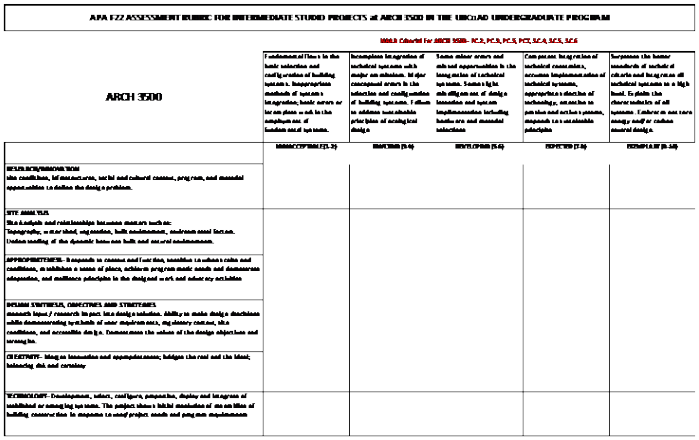
PC.3_Assessment Sequence. _
The architectural learning outcomes of Ecological Knowledge and Responsibility is assessed in the course ARCH 4510, Integrated Architectural Solutions, at the program level. However, this learning outcome is also assessed at courses level across curriculum starting at the Intermediate Level in the course Architecture Design Studio IV ARCH 3500 and continue through the course Architecture Design Studio V ARCH 3501 towards ARCH 4510. The sequence of learning outcomes for the Ecological Knowledge and Responsibility from course to course is a sequence of implementation. Progressively courses include higher number of expected elements in the students designed work, such as the impact on climate of design decisions principles from form to materiality, energy conservation, adaptation and resiliency. As the program instills in the student the holistic understanding of the dynamic between built and natural environments, course's prompts include a background, and ethos of ecological knowledge and responsibility and an ecological consciousness of the design practice.

PC.3 Assessment at ARCH 3500
At ARCH 3500 the site analysis of climate, solar radiation, and rain site conditions, also explored as site's hydrosphere, lithosphere, atmosphere, and biosphere conditions, are inputs with expected impacts into the designed solution. For this specific learning outcome, the assessment's rubric for the benchmarks of Midterm and Final reviews includes the following assessment items:

- 1/SITE ANALYSIS; Site Analysis and relationships between matters such as:
  Topography, water shed, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.
- 2/ APPROPRIATENESS- Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs and demonstrate adaptation, and resilience principles in the designed work and advocacy activities.

In addition, the site's infrastructures, social, cultural, and historical conditions are considered learning outcomes of the course load.
This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Exemplary. The B.Arch program sequence is expecting at the end of this course that 80 % of the students' designed work demonstrate the integration of previous items 1/ and 2/ into the project by rating EXPECTED or better on average. The impact of the research is expected to be evident in the project's resolution and ideas.

ARCH 3500_ Assessment Rubric:



ARCH 3500					
	Fundamental flaws in the basic selection and configuration of building systems. Inappropriate methods of systems integration; basic errors or lacunae pass as oversights in the comprehension of function and systems.	Incomplete integration of technical systems with major omissions. Major conceptual errors in the selection and configuration of building systems. Fails to address sustainable principles of working load design	Some minor errors and oversights in the integration of technical systems. Some slight misalignment of design intention and systems implementation including basic area and material selection	Competent integration of technical considerations, accurate implementation of technical systems, appropriate selection of technology, materials in particular and systems approach to sustainable principles	Surpasses the basic standards of technical criteria and integration all technical systems to a high level. Exhibits clear theoretical understanding of all systems. Endeavors new energy saving and creative material design.
SITE ANALYSIS/RESPONSIVENESS the conditions, infrastructures, social and cultural contexts, programs, and material opportunities to define the design problem.					
SITE ANALYSIS Site Analysis and relationships between matters such as: Topography, water shed, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.					
APPROPRIATENESS: Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs and demonstrates adaptation, and resilience principles in the design and work and advocacy activities					
DESIGN STRATEGIES, OBJECTIVES AND STRATEGIES research based / research driven in part, has design solution. Ability to make design decisions while demonstrating understanding of wider environment, regulatory context, site conditions, and accessible design. Demonstrates the values of the design objectives and strategies.					
CREATIVITY - Shows innovation and appropriateness; bridges the real and the ideal; balancing risk and certainty					
TECHNOLOGY - Development, select, configure, preparation, display and integration of established or emerging systems. The project shows a holistic consideration of one or more of building construction in response to overall project needs and programmatic requirements					

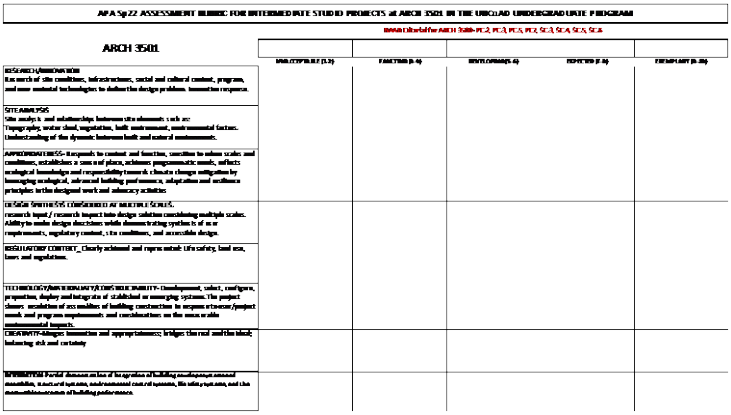
PC.3 Assessment at ARCH 3501
At ARCH 3500 the site analysis of climate, solar radiation, and rain site conditions, also explored as site's hydrosphere, lithosphere, atmosphere, and biosphere conditions, are inputs with expected impacts into the designed solution. For this specific learning outcome, the assessment's rubric for the benchmarks of Midterm and Final reviews includes the following assessment items:

- 1/SITE ANALYSIS; Site Analysis and relationships between matters such as:
  Topography, water shed, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.
- 2/ APPROPIATENESS: Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs, reflects ecological knowledge and responsibility towards climate change mitigation by leveraging ecological, advanced building performance, adaptation and resilience principles in the designed work and advocacy activities

In addition, the site's infrastructures, social, cultural, and historical conditions are considered learning outcomes of the course load.

This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Exemplary.The Course ARCH 3501 assessment output is expecting at the end of this course that 80 % of the students' designed work demonstrate the integration of previous items 1/ and 2/ into the project by rating EXPECTED or better on average. The impact of the research is expected to be evident in the project's resolution and ideas.

ARCH 3501- Assessment Rubric:



PC.3 Assessment at ARCH 4510

At ARCH 4510, Site Orientation and Climate (Sustainable Design Principles), Envelope (Sustainable Design Principles), Heating, Ventilation, AC (Sustainable Design Principles) and Materials (Sustainable Design Principles), are learning outcomes related to the Ecological Knowledge and Responsibility. The assessment's rubric to assess Ecological Knowledge and Responsibility for the benchmarks of Midterm and Final reviews of ARCH 4510 includes the following assessment items:

- 1/ Solar orientation/Sustainability
- 2/ Envelope Design/Sustainability design principles
- 3/ MEP/Sustainability design principles
- 4/ Materials/ Sustainability design.

This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Exemplary. The B.Arch program assessment output is expecting at the end of this course that 80 % of the students' designed work demonstrate the integration of previous items 1/, 2/, 3/, 4/ into the project by rating EXPECTED or better on average.

ARCH 4510 Assessment Rubric:

Checklist for ARCH4510 Final Juries – Fall 2021
TEAM _____

		not met		adequate		exceptional	
(please score lowest to highest)		1	2	3	4	5	
1/	Solar Orientation/Sustain notes	1	2	3	4	5	
2/	Site Plan Accessibility notes	1	2	3	4	5	
3/	Life Safety Plan notes	1	2	3	4	5	
4/	Structure Integration notes	1	2	3	4	5	
5/	Envelope Design notes	1	2	3	4	5	
6/	MEP Integration notes	1	2	3	4	5	
7/	Materials Selection Notes	1	2	3	4	5	
		___	___	___	___	___	SUBTOTAL ___
Other Notes:							
Design Synthesis/Response notes		1	2	3	4	5	
Graphic Representation notes		1	2	3	4	5	
Technical Understanding Notes		1	2	3	4	5	
		___	___	___	___	___	TOTAL ___

Assessment of Ecological Knowledge and Responsibility in M.Arch Program

The current assessment rubric in the M.Arch studio courses ARCH 6603 and 6604 is based on a several criteria, with a scale of 1-5 in each area. Each of these elements falls under one of four broad rubric categories: Construction, Craft, Intellectual Clarity, and Completion. Within each of these categories are more specific criteria. Regarding Ecological Knowledge and Sustainability, we assess students' understanding and application of a number of different elements:

- Site and Context Analysis (including Climate, Flora, Fauna, Geomorphology, Water)
- Site Orientation and Climate Design Issues
- Building Envelope (including Materials and Performance)
- Materials (including Embodied Energy and Life Cycle Costing)
- Environmental Control Systems (including Approaches to Shading and Natural Ventilation)
- Energy (including Renewable Energy Sources as a Primary Approach)

These elements fall primarily under Completion and Construction, though depending on the project they can also be

central aspects of both the intellectual clarity of a student's design, as well as its craft.

3. EVIDENCE

The B.Arch and M.Arch offer various forms of evidence to the NAAB visiting team as illustrations of our Ecological Knowledge and Responsibility teaching. For required undergraduate and graduate courses, we provide all course lectures, syllabi, and handouts together with the quizzes, exams, and technology and design studio projects in courses related to this topic area.

4. FUTURE DEVELOPMENTS AND BENCHMARKING

We intend to expand our engagement with Ecological Knowledge and Sustainability across our curriculum. From the perspective of assessment, these issues will figure more prominently in our grading and assessment rubrics moving into the future. We intend to include categories specifically evaluating sustainability. In the graduate Level III sequence, for instance, a fifth category titled Ecological Approaches may be added to the current four. Although we assess sustainability within the current rubric, it is not as transparent and front-facing as it could be.

Moving forward, our assessment methods will improve. In each course, comprehensive and expanded rubrics will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

In addition to improving our future assessments of ecological knowledge and sustainability, we are also actively engaging in expanding our programs. For instance, in the third yea of the undergraduate architecture programs, students are offered the option to enter either the five-year Bachelor of Architecture program (B.Arch) or the four-year Bachelor of Science in Environmental Design program (B.ENVD). The Undergraduate architecture program has initiated a review of the B.ENVD curriculum. Our hope is to reshape it into a degree program focused primarily on ecological knowledge and environmental responsibility, but with mutually supporting and cross-listed courses with the B.Arch and M.Arch programs. The goal is to create a robust ecological curriculum within our college. Since 2019, the director of undergraduate architecture has been collecting data on other environmental design programs in the nation to provide base information to faculty with expertise in this realm, in order to develop curriculum review, define new lines of work, and identify faculty for the B.ENVD program. The expansion of this program also seeks to engage students interested in continuing their education in this field at the M.Arch program level, by completing a professional bachelor's degree and master's degree in six years (four + two). We anticipate the growth of the B.ENVD program curriculum, with faculty teaching in both the B.ENVD and M.Arch programs, in order to increase the consistency of sequences and themes. The B.ENVD program has the potential to offer a flexible, ecological, and synthesizing curriculum that will complement both our B.Arch and M.Arch programs—since they will share courses.

The expansion of ENVD faculty with expertise in ecological knowledge and responsibility will increase awareness and focus in these areas, in concert with the B.Arch and M.Arch programs. In preparation for this development, new elective courses have begun to seed approaches, agendas, and curriculum in the College.

In the graduate M.Arch program, students can currently elect to take a disciplinary "concentration" in one of three areas: Media + Fabrication, Sustainable Architecture, or Urban Systems. We plan to grow all three concentrations in the near future, expanding our course offerings in each areas. We are also encouraging greater numbers of students to choose concentrations in order to structure their education around a focus area. The number of faculty at UHCoAD with a specific interest in sustainable design is increasing, including a current faculty search in the area of Sustainable Urbanism and Infrastructure.

Lastly, it is important to mention two lines of work and development:
1/ A task force has reviewed the undergraduate thesis program: Thesis Prep and Thesis Project, over the Spring 21 and Summer 21 to define new pedagogical goals and ambitions. One of the goals is to structure the program as a required final element for the ENVD program as the culmination of the degree. For this purpose, over the academic year of 2020-21 has produced the first case lead by an ENVD student with a successful project awarded by external jurors in the Super Jury of Spring 21.
2/ In 2021 the HTC program coordinator, Michael Kubo, and Master Studio coordinator Matthew Johnson were awarded the ACSA Course Development in Architecture, Climate Change, and Society for their proposal *GULF: Architecture, Ecology, and Precarity on the Gulf Coast*. This prize will support the future implementation of ecological knowledge and responsibility for both B.Arch and ENVD undergraduate/graduate students.

3.1 PC 4 - History and Theory

Assessment, Benchmarks, and Evidence
BARCH and MARCH programs use a variety of methods to assess the efficacy of teaching and student outcomes across our courses in history, theory, and criticism. Required undergraduate and graduate HTC courses emphasize developing skills in critical reading, writing, and argument through a combination of written responses, essay assignments, quizzes, exams, and class discussions and presentations that require active engagement. As courses centered in the humanities, learning outcomes for required HTC courses are typically assessed holistically—exam formats, written assignments, and other deliverables are used to assess multiple intersecting learning outcomes together, rather than targeting specific questions or assignments to individuated learning outcomes in each course.

As we have transformed our required HTC curricula for BARCH and MARCH students (described in more detail under Future Developments below), we have begun to develop more data-based procedures for assessing student learning objectives that will be used for future evaluations of these HTC courses:

In the BARCH:
ARCH 1358 – Introduction into Design Culture
ARCH 2350 – Survey of Architectural History I (to be renamed History of the Built Environment I in 2022-23)
ARCH 2351 – Survey of Architectural History II (to be renamed History of the Built Environment II in 2022-23)

In the MARCH:
ARCH 6357 – Contemporary Theory and Critical Practice
ARCH 6359 – Modern Architecture and Urbanism
ARCH 6376 – Urban Determinants

This development included an inaugural assessment session held in December 2021 (recorded) in which the HTC coordinator, directors, and instructors for these courses shared and discussed syllabi, learning objectives, teaching methods, grading rubrics, assignment formats, and data-based student outcomes for these courses. We plan to establish an expanded assessment session at the end of each course cycle in which faculty, coordinators, directors, and administrators will meet to collect and analyze data on student outcomes for each course and/or adjust teaching methods and course content if needed based on the results. In tandem we are developing new benchmarks across required elective courses in the BARCH and MARCH HTC sequences that will allow these outcomes to build on each other from semester to semester, to better prepare students with the skills in historical thinking, writing, and reading that are crucial to a holistic understanding of global histories and theories of architecture and urbanism. Based on discussions between the HTC coordinator and faculty, an initial framework for these sequential benchmarks in the BARCH is as follows:

Year 1 [1358–Intro to Design Culture]
Students will develop a thematic understanding of major social, cultural, economic, and political issues in the designed environment through tools of observation, description, and reflection.
The expectation is that 90% of students would receive a B-/80 or better (out of 100) on average

Year 2 [2350/2351—History of the Built Environment I/II]
Students will develop tools for historical thinking, and tools of critical writing in the design disciplines
The expectation is that 85% of students would receive a B-/80 or better (out of 100) on average

Year 3 [Introductory HTC electives]
Students will develop tools for critical reading through an engagement with specialized topics in the histories and theories of architecture and urbanism
The expectation is that 80% of students would receive a B-/80 or better (out of 100) on average

Years 4-5 [Advanced HTC electives]
Students will deepen their critical reading, writing, and thinking skills through the advanced study of specialized topics in the histories and theories of architecture and urbanism
The expectation is that 80% of students would receive a C/75 or better (out of 100) on average

In the BARCH program, assessments for the current ARCH 1358: Introduction to Design Culture course consist primarily of weekly quizzes and three longer exams that emphasize students' retention of the broader ideas and concepts under discussion, as well as the specific data (people, places, dates, and events) through which we understand the history of architecture and urbanism. Weekly written responses and active participation in weekly discussion groups are used to assess students' coverage and understanding of the weekly course content, which includes lectures, readings, films, and/or podcasts. In Fall 2021, 92% of the class (239 students) earned a C/75 or better course grade; 88% of the class earned a B/85 or better course grade, and 69% earned an A-/90 or better. The average course grade was 89/B+ and the median course grade was 92/A-. On Exam 1—written to assess students' understanding of the course's themes of design as a profession versus design as an attitude, inclusion and access to the study and practice of design, and design in relation to heath, wellness, and disability in the built environment—96% of students earned a C/75 or better. On Exam 2—written to assess students' understanding of the course's themes of industrial design and its history, technologies of the climatized interior, and domesticity from the detached house to multi-unit housing—90% of students earned a C/75 or better. On Exam 3—written to assess students' understanding of the course's themes of maintenance and care, matter, labor, waste, and inclusion and exclusion in the built environment—91% of students earned a C/75 or better.

The ARCH 2350 and 2351 survey sequence stresses students' development of historical thinking skills in relation to the present. In Fall 2021, 86% of students in the revised ARCH 2350 course (212 students) earned a C/75 or better course grade; 75% of the class earned a B/85 or better course grade, and 42% earned an A-/90 or better. The average course grade was 83/B- and the median course grade was 88.5/B+. The revised 2350 course (the first part of the revised two-semester survey beginning in 2021-22) is divided into three parts, each of which concludes with a take-home exam which students have 24 hours to complete and upload. Each exam consists of eight short questions that require 5–6-line responses, and one long essay question that requires a 600-word short response, with attached images for each response question as memory aids. Exam questions are designed to assess students' abilities to discuss and critically analyze architecture, landscape, and urbanism in relation to political, social, environmental, cultural, and economic factors and with an awareness of global interdependencies, connections, conflicts, and alliances. On Exam 1—written to assess students' understanding

of the course's historical themes of empire, urbanization, and expansion—students earned an average of 85/B; 92% of the class earned a C/75 or better. On Exam 2—written to assess students' understanding of the course's historical themes of colonialism, commodities, trade, faith, philosophy, and building—students earned an average of 83/B–; 89% of the class earned a C/75 or better. On Exam 3—written to assess students' understanding of the course's historical themes of rationalization, nationalism, and industrialization—students earned an average of 82/B-; 88% of the class earned a C/75 or better.

The revised ARCH 2350 also incorporates written assessments that emphasize a refinement of students' writing and interpretive abilities, including two "commentary" assignments spread over the semester in which students are asked to critically read an assigned text related to the course material and write a 1000-word essay that comments on the arguments of the text. Students are assessed based on their ability to avoid paraphrasing the content of the text and instead focus on the author's viewpoint, as well as on the focus, argument, and structure of their written responses, as summarized in a rubric provided to students (included below). The course also includes a writing workshop in the class that focuses on these aspects of the assignments. In Fall 2021, students improved their reading, writing, and analytical skills over the course of the semester: on the first commentary assignment, students who submitted this assignment earned an average of 84/B and 90% of the class earned a C/75 or better; on the second commentary assignment, students who submitted this assignment earned an average of 88/B+ and 94% earned a C/75 or better.

For ARCH 2351 in Spring 2020—the last version of this course to be taught prior to its replacement in Spring 2021 by the revised course developed by Dr. Ramaswamy which will complement the updated ARCH 2350—82% of the class (159 students) earned a C/75 or better course grade; 52% of the class earned a B/85 or better course grade, and 16% earned an A-/90 or better. The average course grade was 80/B- and the median course grade was 85/B-. The revision of the content, assignments, and assessment criteria for this course in 2021-22 is intended to raise these grade ranges in line with the continued development of sequential benchmarks for the required HTC courses as described above.

Grading Rubric for ARCH 2350 Written "Commentary" Assignments, Fall 2021

	Excellent 45-43	Good 42-39	Acceptable 38-35	Acceptable but needs significant improvement 34-31	Poor 30-27
Focus and Argument 45 points	Clear and precise argument and thesis statement with details that support it. The commentary considers, responds, or evaluates the reading well.	Relatively clear identified argument or thesis statement with some details that support the argument. The commentary presents a plausible response to the reading.	Identifiable thesis but sometimes vague and unclear. Ambiguity in the details. There is some seed of a response to the reading.	No explicit statement but shows signs and markers of an early argument which needs to be pried out, it is not evident.	The whole paper is muddled, confused.
Structure and Details 45 points	The introduction is well crafted, clarifies the main topic, and provides an overview of the paper. Information is relevant and presented in a logical order. The conclusion is strong. There is a very clear paragraph model. There are goalposts in the writing. It shows care. There are a lot of details that explain the argument.	The introduction states the main topic and provides an overview of the paper. A conclusion is included. There is order and details that explain the main thesis or argument.	There is structure but it is a bit muddled, but the basic form is there.	The structure and details are repetitive. There are inconsistencies to the argument, details and structure.	
Format 10 points	There are footnotes or endnotes; spell checks are applied when needed. There is a clear title and overall care.		Format is inconsistent.		Format is problematic or missing.

In the MARCH program, the required ARCH 6357 and ARCH 6359 courses are both conducted as a combination of lecture and seminar modes, relying on class discussion to assess students' engagement with the concepts and ideas presented through lectures and assigned weekly readings. In both courses, students are required to give in-class presentations and are assigned responsibilities for leading weekly class sessions and discussions. This provides a means to assess their abilities to synthesize and communicate their understanding of the specific historical and theoretical phenomena that we study.

In ARCH 6357—Contemporary Theory and Critical Practice, student learning outcomes are assessed through weekly reading responses (of 500 words or less) through which students are asked to articulate their questions, criticisms, observations, or other thoughts in response to the course content. In the Spring 2020 course, students read and analyzed a seminal work of recent critical architectural theory in the second week of the course (Robert Somol and Sarah Whiting's "Notes Around the Doppler Effect and Other Moods of Modernism") and then spent two weeks developing group slide presentations on key figures, concepts, and histories of architectural theory that were necessary to unpack this text; these presentations were given in Week 4 of the course and then compiled into a final dossier including a bibliography of related readings beyond the assigned course content. Subsequent weeks were devoted to a range of cultural, political, and theoretical issues in contemporary design practice; in each week, students were asked to prepare group presentations on two key practices whose work embodies or is related to each week's thematic content (two groups per week). Each student was required to participate in one Week 4 presentation group and in three "practice/project" presentation groups in Weeks 6-15. In Spring 2020, 100% of the class (17 students) earned a course grade of A-/90 or better; 9 of 17 (53%) earned an A grade. Grading for the three class presentations was intended to increase in difficulty from the initial (Week 4) presentation to the project/practice presentations; on the first (Week 4) presentation, students earned an average of 95/A and 100% of the class earned a B/85 or better; on each of the three subsequent presentations, students earned an average of 93/A- and 88% earned a B/85 or better.

ARCH 6359—Modern Architecture and Urbanism (revised as of Fall 2021 by Dr. Ramaswamy), students are assessed through written assignments, required weekly responses to the assigned course content, and in-class

presentations of the assigned readings and case studies (which include buildings, drawings, exhibitions, schools of thought, and historical and theoretical texts). Students are required to give a final research presentation, conducted in groups, in which they are asked to identify an idea, concept, or question related their studio practice on which they then develop and present a final project to the class. This assignment is used to assess students' development of skills in research, critical analysis, and presentation; groups were asked to start their projects halfway through the semester and to discuss the project with a written abstract with the instructor to clarify the project and the argument. In Fall 2021, 100% of the class (34 students) earned a C/75 or better course grade; 62% of the class earned a B/85 or better course grade, and 18% earned an A-/90 or better. Both the average and the median course grade were 86/B. On the final research presentation, students earned an average of 88/B+ and 100% earned a C/75 or better.

ARCH 6359 also incorporates written assessments that emphasize a refinement of students' writing and interpretive abilities, through two "commentary" assignments in which students are asked to critically read an assigned text related to the course material and write a 1500-word essay that comments on the arguments of the text. Students are assessed based on their ability to avoid paraphrasing the content of the text and instead focus on the author's viewpoint, as well as on the focus, argument, and structure of their written responses, as summarized in a rubric provided to students (included below). After the first commentary assignment, students received comments from the instructor, which improved the quality of the second commentary. In Fall 2021, on the first commentary assignment, students earned an average of 84/B and 88% of the class earned a C/75 or better; 18% of the class earned an A-/90 or better. On the second commentary assignment, students earned an average of 88/B+ and 100% earned a C/75 or better; 44% of the class earned an A-/90 or better.

Grading Rubric for ARCH 6359 Written "Commentary" Assignments, Fall 2021

	Excellent **20-19 pts**	**Good** **18-16 pts**	**Acceptable** **15-13 pts**	**Acceptable but needs significant improvement** **13-12**	**Poor** **12 or below**
Focus and Argument	Clear and precise argument and thesis statement with details that support it. The commentary considers, responds, or evaluates the reading well.	Relatively clear identified argument or thesis statement with some details that support the argument. The commentary presents a plausible response to the reading.	Identifiable thesis but sometimes vague and unclear. Ambiguity in the details. There is some seed of a response to the reading.	No explicit statement but shows signs and markers of an early argument which needs to be pried out, it is not evident.	The whole paper is muddled, confused.
Structure and Details	The introduction is well crafted, clarifies the main topic, and provides an overview of the paper. Information is relevant and presented in a logical order. The conclusion is strong. There is a very clear paragraph model. There are goalposts in the writing. It shows care. There are a lot of details that explain the argument.	The introduction states the main topic and provides an overview of the paper. A conclusion is included. There is order and details that explain the main thesis or argument.	There is structure but it is a bit muddled, but the basic form is there.	The structure and details are repetitive. There are inconsistencies to the argument, details and structure.	
Format	There are footnotes or endnotes; spell checks are applied when needed. There is a clear title and overall care.		Format is inconsistent.		Format is problematic or missing.

The BARCH and MARCH programs have also sought to incorporate a broader range of outside assessments of student work in a number of undergraduate and graduate history electives, including informal review sessions at the end of the semester where students present and discuss their work with invited guests. These final projects have ranged from the production of booklets and pamphlets encompassing students' historical and

theoretical investigations, to analytical studies of buildings and urban spaces, to the creation of innovative hypothetical curricula for architecture schools of the students' design. Group work is emphasized where possible as a further tool for student learning and as a means of assessing student engagement and participation. Student and guest feedback are used for assessment and course correction throughout our required and elective HTC courses, both among the HTC faculty and in discussions with the HTC program coordinator together with the undergraduate and graduate architecture directors and coordinators. In addition, both the required 6357 and 6359 courses as well as a number of our recent electives now incorporate a "syllabus critique," conducted with students during the course, in which students are asked to assess the organization and content of the syllabus and give feedback on its strengths and weaknesses and/or potential areas of development. These comments are then incorporated into future iterations of these courses.

Lastly, BARCH and MARCH programs always seek to understand the state of history and theory curricula at other schools of architecture to better understand broader pedagogical trends in architectural and urban history and to identify content, teaching methods, and assessment criteria that we can apply to our own courses. Our most recent tenure-track hire in the HTC program, Dr. Deepa Ramaswamy, is currently spearheading the transformation of our two-semester architecture history survey sequence based on an examination of survey courses and syllabi at comparable architecture schools in North America. In January 2022, Dr. Ramaswamy led a grant-funded workshop supported by the Global Architecture History Teaching Collaborative (GAHTC) in which educators from a range of U.S. colleges and universities gathered to assess the state of the contemporary architecture history survey. A significant portion of this workshop included a sharing and assessment of various grading rubrics and assignment formats in various survey courses, including iterative writing assignments, collaborative and group projects, and workshops designed to foster critical writing and reading skills. The results of these discussions and information-gathering will be used to further develop the content of our own survey sequence in future years.

3.1 PC 5 – Research and Innovation

SUBMITTED APR TEXT

PC.5 Research and Innovation—How the program prepares students to engage and participate in architectural research to test and evaluate innovations in the field.

Program Response:

BARCH

ARCH 2501 – Architecture Design Studio IV
ARCH 3500 – Architecture Design Studio V
ARCH 5500 – Architecture Design Studio VIII,
IX, X

MARCH

ARCH 6359 – Modern Architecture and Urbanism
ARCH 6603 – Design Studio III
ARCH 6376 – Urban Determinants
ARCH 6A49 – Environmental Tech III

ARCH 6A51 – Construction Technology IV
ARCH 6604 – Design Studio IV
ARCH 6393 – Master Project Prep

Approach

Research and innovation are a core part of all courses at the College. As a Tier One Research Institution, the university implemented a strategic plan in 2018 with four primary research areas to further refine and focus the University's goals of expanding research opportunities. One of these areas is central to the College's mission: Sustainable Communities and Infrastructure. The College has worked at all levels of its programs to prepare students to conduct research and to have working understandings of innovative processes and techniques within the discipline and profession.

Over the last five years, the College has developed several areas to strengthen its ability to conduct research. These include:

- Hiring of more tenured and tenure-track faculty with strong research experience and potential.
- Developing and expanding facilities for research and innovation.
- Integrating basic research skills into early curricula at both graduate and undergraduate levels.
- Implementing innovative technologies
- Refining the role of the upper-level studios to become more innovative and research-driven.
- In the Master of Architecture program, a Precedents & Research Methods Workshop and a Pre-Design Workshop have been incorporated into 6393: Master Project Preparation—a required class for every student receiving this degree.

Assessment

Bachelor of Architecture Program:

First Intermediate Studio ARCH 2501- Architectural Studio IV

As discussed in PC.2, the second-year educates students to understand architecture disciplinary questions with a historical perspective and profoundness. The course ARCH 2501 Architectural Design Studio IV dedicates the first half of the semester to precedent analysis early in the curriculum throughout research exercises. This change was introduced to stress the student's development of analytical tools as a conclusion of the lack of precedent references used by students in their final presentations with clear relationship with the project developed. Data was collected in the APAR 2019-20 over ARCH 5500 Studio level with following results (19% rating in the rubric item "Precedent"):

Year: 2019-20	***N***	***Design***	***Technology Proficciency***	***Creativity***	***Appropiate to context***	***Craft***	***Precedent***

2019-2020 ***Percentage of students earning a rating of "acceptable" or better or the number of project assessed***	*46*	*26%*	*10%*	*10%*	*59%*	*15%*	*19%*

Performance Standard*: We expect that 90% of our students will earn an average rating of "Acceptable" or better on the DESIGN element on the Arch 5500 Project.*

Assessment Results & Analysis*: In 2019-2020, 26% of the student's work assessed by external reviewers over the work produced in three sections chosen randomly of professional Level Course Arch 5500 (N = 46 assessed projects) earned an average of "Acceptable" or better on their DESIGN ELEMENT. The standard was not met.*

This lack of success demonstrates a persistent need to stress the conceptual and critical design thinking of each student as well as implement their capacity on representing the built environment and the relationship with the design output. A change on the level assessed that transits from multiple portions of courses (Arch 4501, Arch 3500, Arch 2500 and Arch 1500) in previous years, is implemented in this report of Academic year 2019-20 to better access in a singular and comprehensive project at the end of the curriculum of the Undergraduate Architecture B Arch.

The second part of the course is dedicated to develop innovative design projects as result of the research as results to innovate beyond research outcomes. Students are expected to develop analytical tools that will permit them to innovate in their design exercises.

Arch 2501 Architecture Design Studio IV and ARCH 3500 are contributing courses of Research and Innovation learning outcome. The courses are assessed at the Final Reviews.

For this specific level, and staring in Spring 21 a group of three faculty members from outside the College is invited to anonymously evaluate the work of a random selection of ARCH 2501 sections receiving a pass grade. They assess the ARCH 2501 sections using a rubric discussed in PC.2 that helps to establish high standards for student research and innovation. All projects are evaluated for the following six criteria: 1. Precedent; 2. Design; 3. Technology; 4. Creativity; 5. Appropriateness; 6. Craft. Question number 1 of the assessment rubric covers the research and precedents aspects of each student's ARCH 2501 Project.

For our performance standard we expect that 80% of our students will earn an average rating of "Acceptable" or better on the Design element of the ARCH 2500 project. In 2020-2021, 80% of the selected students who passed the ARCH 2501 course level earned an average of "Acceptable" or better on their Precedent element. The standard was met.

Despite this success, there remains a persistent need to challenge the conceptual and critical design thinking of each student. In Spring 2022, a restructuring of the Arch 2501 Project curriculum was implemented to better coordinate faculty in the studio sequence to directly address better standards.

Second Intermediate Studio ARCH 3500- Architectural Studio IV

As discussed in PC.2, the third-year educates students to operate design realities with technological knowledge. In previous NAAB reposts the element site analysis (B.4) was mark as “No consideration of topography, water shed, vegetation. No demonstration of all the other factors such as feasibility, land cost, construction and understanding of these environmental factors” in addition the element B.3 Sustainability marked “The design work does not reflect any ability to integrate the research and other factors into the projects”. The combination of these two elements promoted the review of the curriculum to stress observations on site and research combined through a series of approaches that starts in 2501, is focused in ARCH 3500 and continued over the following semester until the course level of ARCH 4510. As response to the matter discussed above, from Fall 20 forward, the course ARCH 3500 Architectural Design Studio V dedicates the third of the semester to site analysis by preforming a series of frames. This change was introduced to stress the student’s capacity of unfold research capacity thought site analysis with the goal of increasing the relationship between input and impact in the architectural response.

For this specific level, and staring in Fall 21 a group of three faculty members from outside the College is invited to anonymously evaluate the work of a random selection of ARCH 3500 sections receiving a pass grade. They assess the ARCH 3500 sections using a rubric that helps to establish high standards for student research and innovation. All projects are evaluated for the following six criteria: 1. Research and Innovation; 2. Site Analysis; 3. Appropriateness; 4. Design Synthesis, Objectives and Strategies; 6. Creativity; 7. technology. Question number 1 of the assessment rubric covers the research and precedents aspects of each student’s ARCH 3500 Project.

For our performance standard we expect that 80% of our students will earn an average rating of “Expected” or better on the Design element of the ARCH 3500 Project. An internal test of this assessment was performed for discussion but not to collect actual data, we have scheduled to collect data of this course in the Fall 22

Professional Level Studio Projects ARCH 5500 Architecture Design Studio VII, VIII, IX / External evaluation.

As discussed in PC.2 after seven semesters of design education, three additional studio courses at the Professional Level, Architecture Design Studios VII, VIII, and IX all them ARCH 5500, are dedicated to establish a series of curated topics that open lines of design and exploration, and research and innovation. The variety promotes the understanding of different possible career paths and encourage students to engage with research topics led by rotating internal and external faculty. Past semesters since Fall 2020 have been progressively orchestrated to distinguish and identify the most appropriate areas of research and innovation that BArch and MArch can offer. The current structure is organized as follows: International faculty, national faculty, research, urban systems, design media, international exhibitions, historic preservation.

Some studios and academic areas collaborate to develop studio prompts with deeper research structures and seeking areas of innovation. These courses also create an array of elements that permits students to capture the structure of the investigated topic: coordinate mini-lectures series, discussions, juries, midterm and final reviews. For instance, courses that have been operating in this capacity are: the Virtual Global Studio as a three-way collaboration between the director of BArch and HTC program coordinator, an ARCH 5500 advanced design studio, and a master’s research studio at the Escuela Técnica Superior de Arquitectura de Madrid (ETSAM), or the Design Media studio lead by Design Media Coordinator. Other lines of collaboration are in development between Studio and Technology to develop the future Tech-Studios pedagogy, that as design field, inversely will be led from the technology academic area.

As BArch and MArch join in this specific course, collaborate and are committed to expanding design faculty in order to provide a broader array of design perspectives in different scales from the territory to the molecular scales, from history, theory, and criticism to design media at national and international scales, consequently, programs have opened several ways of hiring visiting professors to bring more global design awareness. This expansion of design faculty and topic offers began in 2018-19 with the line of national/international design pedagogies driven by the Stern Visiting Position: every semester one upper level / vertical studio (ARCH/MARC) programs hire an architectural office with an international reputation to lead one studio in collaboration with an internal and rotational faculty. In previous years the position has been filled by the tandem of Bryan McKay Lyons and Jesse

Hager and Brooks and Scarpa and Jesse Hager, and this academic year of 2020-21 Estudio MAIO and Daniel Jacobs. The expansion continues with two additional lines: first, the recently inaugurated line of work Mexico - Texas that began this Fall 21 with the hire of a Mexican architect in practice that, in collaboration with the internal studio faculty Rafael Longoria is teaching this Fall 21 a topic studio on explorations of urban interventions in the Hércules neighborhood of Queretaro, Mexico. Second: the research studios based on books or exhibitions projects develop as Design as Scholarship as is the Ksestudio wok on Micropolitan America, a books / exhibition in progress that has been operating between different institutions and over several semesters.

For this specific level, and staring in Spring 20 a group of three distinguished architects from outside the College is invited to anonymously evaluate the work of a random selection of ARCH 5500 student sections receiving a pass grade. They assess the ARCH 5500 sections using a rubric discussed in PC.2 that helps to establish high standards for student research and innovation. All projects are evaluated for the following six criteria: 1. Design; 2. Technology; 3.Creativity; 4. Appropiateness; 5. Craft; and 6. Position/Precedent. Question number six of the assessment rubric covers the research and precedents aspects of each student's ARCH 5500 Project.

The first assessment completed with this process was executed in Spring 21 and organized as follows: A group of external evaluators reviewed 28 project of fifth year projects of Arch 5500 (the culminating design project level for a UH architecture undergraduate BArch program student) at the end of each spring semester for the following criteria: Design, Technology, Creativity, Appropriateness to context, Craft and Precedent Proficiency. The external evaluators vary from year to year. For this rating cycle they included: Associate Professor of Architecture at the College of Architecture at Texas Tech University, Ersela Kripa. Professor of Architecture at CCA/California College of the Arts in San Francisco, Thom Faulders, and Associate Professor at School of Architecture of Carnegie Mellon University, Jeremy Ficca.The Arch 5500 Projects are rated on the following scale: Exemplary = 10-9, Better = 8-9, Acceptable = 6-7, Developing = 4-6, Faulting = 3-4, Unnaceptable = 0-3.The ratings given by the external reviewers are averaged together to create each student's performance rating in each criteria. Students who earn an average of "Acceptable" on their Design element demonstrate highly skilled abilities in their programmatic organization, contextual response, material form, and development of their Arch 5500 Project. The results were analyzed by the Undergraduate Director. The results are projected over a bar table of 20 columns extrapolating the total number of 28 assessed projects to the number of 20. For our performance standard of that specific semester, we expected that 90% of our students will earn an average rating of "Acceptable" or better on the DESIGN element on the Arch 5500 Project.

Assessment Results & Analysis: In 2020-2021, 77% of the student's work assessed by external reviewers over the work produced in three sections, chosen randomly, of professional Level Course Arch 5500 (N = 28 assessed projects) earned an average of "Acceptable" or better on their DESIGN ELEMENT. The standard was not met. This lack of success demonstrates a persistent need to stress the conceptual and critical design thinking of each student as well as the need to implement their capacity on researching and innovating to satisfy a better response to the field.

Assessment data:

Year: 2020-21	N	Design	Technology Proficiency	Creativity	Appropriate to context	Craft	Precedent
Percentage of students earning a rating of "acceptable" or better or the number of project assessed	28	77%	72%	72%	72%	63%	31%

MATERIAL COVERED IN ARCH 2501 Precedents

Class discussions on:

1/ Tradition, modernism and postmodernism

2/ Difference between paradigm/classic and building

3/ Idea of typology

4/ Documentation, elaboration of research documentation

5/ Difference between diagram and Scheme

MATERIAL COVERED IN ARCH 3500 Site Analysis

Lectures:

Site Analysis

1/ social context

2/ cultural context,

3/ historical context,

4/ physical context,

5/ ecological context,

6/ material context,

7/ infrastructural context.

Master of Architecture Program:

Master Projects External Evaluation

As discussed in PC.2, the graduate program has an established yearlong Master Project in the final year of the program focused on developing innovative design research projects rooted in our students' own research and design interests. The goal of the three- credit-hour Master Project Preparation class (ARCH 6393) is to learn how to effectively construct and communicate a cohesive architectural position alongside acquiring essential skills in the pre-design phase of architecture projects. The class includes workshops in architectural programming and effective communication of both analysis and synthesis. The study of precedents and research methods is an important component of the class. Projects developed during the Master Project Preparation class are then completed in a subsequent six-credit-hour Master Project Studio (ARCH 7601) where ideas can be developed in considerable depth.

Every year a group of three distinguished architects from outside the College is invited to anonymously evaluate the work of every student receiving a master's degree in architecture. They assess the Master Project using a rubric discussed in PC.2 that helps to establish high standards for student research and identifies graduation awards. All projects are evaluated for the following six criteria: 1. Concept; 2. Design; 3.Graphics/Craft; 4. Technology; 5. Responsiveness; and 6. Position/Precedent. Question number six of the assessment rubric covers the research and precedents aspects of each student's Master Project.

For our performance standard we expect that 90% of our students will earn an average rating of "Acceptable" or better on the

Design element of the Master Project. In 2019-2020, 100% of the students who produced a Master Project (N = 20) earned an average of “Acceptable” or better on their Design element. The standard was met.

Despite this success, there remains a persistent need to challenge the conceptual and critical design thinking of each student. In Fall 2019, a restructuring of the Master Project curriculum was implemented to better coordinate faculty in the prep and studio sequence to directly address this issue.

Historical data:

Year:	N	Design
2019-2020 Percentage of students earning a rating of “acceptable” or better	20	100%
2018-2019 Percentage of students earning a rating of “acceptable” or better	25	100%
2017-2018 Percentage of students earning a rating of “acceptable” or better	36	100%
2016-2017 Percentage of students earning a rating of “acceptable” or better	23	96%
2015-2016 Percentage of students earning a rating of “acceptable” or better	28	43%

Research Focused Faculty

In 2011, the Carnegie Foundation for the Advancement of Teaching elevated the University of Houston to a Tier One Research Institution. As such, the University has supported the College in expanding its faculty through targeted hires in several critical research areas at both tenure-track and tenured levels. In 2016, the Colleges underwent an analysis of its teaching needs and implemented a multi-year plan to expand its faculty and leadership opportunities to support research as a core mission of the College and University. The College set out a goal to create new endowed professorships to further this goal of drawing top faculty to the College.

Research Facilities

The 2016 Strategic Plan also found that the College needed to expand its ability to conduct advanced research through facilities focused on innovative technologies and media such as robotics, digital fabrication, augmented reality, and additive manufacturing. The College put in place a structure to begin fundraising for a new Advanced Media Technology Lab.

Research Skill Foundations

The ability of students to conduct advanced research relies on multiple years spent developing basic research skills. That is, you cannot put students into advanced research studios or seminars and expect them to succeed unless they have spent years developing strong foundations in critical thinking, information gathering and analysis, and the ability to construct and test hypotheses. The College has been working throughout the foundation and intermediate levels in Studio, Technology, Design Media, and HTC to strengthen students’ research capabilities. One of the primary ways this has been accomplished is through an increased use of case studies and precedent analysis across all curriculum coordination areas.

Innovative Media Technologies in Architectural Technology Curriculum

As discussed below in PC.6, the Technology curriculum stream has experimented with implementing innovative technologies such as augmented reality (AR) and virtual reality (VR) within courses. These technologies are rapidly

changing the way architects, clients, and contractors are visualizing the built environment.

Research Studios and Thesis

Over the last few years, the College has focused on refining upper-level studios in both our undergraduate and graduate programs for advanced research driven by faculty research areas. The goal is to make the advanced studios (ARCH 5500 and ARCH 7600) more experimental and focused on critical innovations within the discipline. While these studios have been known within the curriculum as the "Professional Level" studios, this may have created a false narrative where students feel they should be focused on designing as the profession exists currently instead of designing for the future of the profession. The College has worked to change this misconception among students and faculty and have made the studios more focused on experimental and innovative understandings of the discipline.

Evidence

Expanded Research Faculty

The College has hired four tenure-track and two tenured faculty in the last five years. These hires include talented researchers in all three of our major curriculum streams of HTC, Technology, and Design Media who have demonstrated research experience in practice and in academia. In addition, the College has hired new directors of the undergraduate and graduate programs with strong research experience across both practice and academia. This has helped to establish research as a primary focus across all curricular areas. Finally, the College was able to raise $1.1 million for its first endowed professor of architecture in the Bill Kendell Memorial Endowed Professor in Design Technologies.

Establishment of the Advanced Media Technology Lab

The college is in the process of constructing what will be one of the most advanced innovation labs in North America. Construction began on the Advanced Media Technology Lab (AMTL) in Fall 2019. The exterior of the building was completed in the summer of 2020 and, after an unexpected delay due to the pandemic, we are currently finalizing funding for the interior buildout and equipment installation. The College anticipates the AMTL will open to students and faculty in 2022.

The mission of the Advanced Media Technology Lab supports the Hines College of Architecture and Design in pursuing innovative research in design and fabrication technologies. We value critical engagement with the role of technology in contemporary design and architecture and look for ways that innovative technologies can augment the way we design, build, and live.

The way that objects, spaces, and buildings are designed and made is undergoing a rapid transformation. It is imperative we find ways to make the built environment less carbon-intensive while simultaneously making it more resilient to climactic change. In addition, innovative technologies such as artificial intelligence and automation create new opportunities as well as challenges to the ways we currently operate. Like the waves of innovation that occurred during the mid-20th century, we are currently experiencing the
beginning of the next industrial revolution. The roles of architects and designers as well as the related industries of manufacturing and construction are rapidly changing and being challenged to be more sustainable and productive.

The Lab will contain several areas to enable advanced research across all programs at the College. These areas include:

- Construction Robotics Lab
- Earth Printing Lab
- Interaction and Collaboration Studio
- Advanced Wood Fabrication Lab

- Digital Textiles Lab
- Circular Materials Lab
- Additive Manufacturing Lab

Evidence of Increased Research Skill Foundations

Beginning in Fall 2020, the foundation level and intermediate studios in the B.Arch. program and the introductory courses in the HTC and Design Media sequences have been revamped to provide stronger skills in research through increased use and training in the library, increased use of case studies, and precedent analysis. The evidence for this can be seen in Intermediate Design Studios.

Increased Focus on Research at Professional Level Studios

Over the last two years, the diversity of new faculty teaching innovative studios rooted in their research has increased in the ARCH 5500 and 7600 level. Eleven new faculty with research-focused practices have joined the faculty in these studios, conducting design research exploring new forms of architectural visualization, architecture for nonhumans, sustainable urbanism, housing for social capital, and design build among multiple other topics.

Future Developments

The College is working in multiple capacities to further the overall University goal of increasing research and innovation. In addition to the Advanced Media Technology Lab opening in 2022, the College has submitted several proposals related to new endowed research professors and other TT hires, new research grants, and a reorganization of elective structures that will expand their capacity for interdisciplinary research and innovation.

Required Master Project Sequence (ARCH6393-ARCH7601) in Master of Architecture Curriculum

The Precedents & Research Methods Workshop places scientific research and precedents research in historical perspective, provides definitions and examples of diverse types of architectural research, and provides exercises to better understand the concept of applied research. The Pre-Design Workshop discusses in greater depth the many facts that must be gathered before starting the design phase of a project and introduces the importance of systematic stakeholder input. The lessons learned by the students in these workshops are assessed as part of the Master Project External Evaluation process. Question number six of the assessment rubric covers the research and precedents aspects of each student's Master Project.

MATERIAL COVERED IN ARCH6393 PRECEDENTS & RESEARCH METHODS WORKSHOP

PRECEDENTS

1. TRADITION & MODERNITY
2. PRIMARY SOURCES / SECONDARY SOURCES
3. TYPOLOGIES / ARCHETYPES / PROTOTYPES
4. DOCUMENTING & DIAGRAMING LESSONS LEARNED
5. PROPER CREDIT / PLAGIARISM
   MLA / CHICAGO STYLE

(Humanities: Notes & Bibliography /

Sciences: Author- Date) RESEARCH

METHODS

1. DEFINITIONS (*The systematic investigation into and study of materialsand sources in order to establish facts and reach new conclusions*.)
2. ORIGINAL RESEARCH / SCHOLARSHIP / CREATIVE ACTIVITIES
3. SCIENTIFIC METHOD: Hypothesis, Data Gathering/Observation,Analysis, Conclusions
4. QUALITATIVE RESEARCH / QUANTITATIVE RESEARCH (Measurements/Statistics)
5. ANALYSIS / SYNTHESIS

MATERIAL COVERED IN ARCH 6393 PRE-DESIGN WORKSHOP

CONTEXT

1. Natural Context: Ecology, Climate, Sun, Winds, Precipitation,Vegetation, Topography, Soil
2. Urban Context: Local Patterns, Flows, Urban Space, Site Survey, Views,Region, Transit
3. Political Context: Regulations, Zoning, Building Codes, ComprehensivePlan, Jurisdiction
4. Historical Context: Past, Present, Future, Precedents, Typologies, Historical Maps/Photos

CONTENT

1. Goals / Needs / Desires / Facts
2. Programing / Space Allocations / Relationships
3. Accessibility / Connectivity
4. Schedule / Phasing
5. Meaning / Image / Branding

CONSTRUCTION

1. Financial Considerations
2. Budget (Land Appraisal, Soft Costs, Construction Estimates)
3. Appropriate Building Systems / Soil Test
4. Integrated Technologies / Sustainability
5. Life-Cycle Costing

Environmental Technology 4 (MK)

This course is attended by students that have successfully finished Environmental Technology 3, where they were exposed to fundamental theory, tools, and methodologies of Environmental Technology, including numerical design of architectural systems in buildings, systems selection, configuration, guideline sizing ratios, schematic planning, basic heat flow calculations, and digital calculation tools at the building component design scale.

The focus of Environmental Technology 4 is integration with design and as such it is developed in parallel with studio. It introduces students to the concept of creatively quantifying environmental parameters using research and analysis to inform their design. The main subjects this course covers are: site assessment, climate and comfort analysis, solar studies, daylight modeling, thermal loads calculations, water management, energy use intensity (EUI), renewables potential and accessibility.

Classes are a combination of Lectures, Workshops and Students' Presentations. Lectures are limited to invited lecturers that cover focus topics, such as daylight glare, accessibility, and water management. Workshops are structured around a comprehensive building performance analysis the students are asked to engage in, that includes energy model baseline definition, daylight assessment and final energy assessment. Students' presentations define milestone moments during the

analysis process and are assessed based on reporting skills on summary data, analytic skills, critical thinking, creativity, and innovation.

Precedents

One full class is dedicated to students' work on precedents. Students work in teams that present one COTE Top Ten awarded project. Familiarizing with COTE Top Ten requirements positions the students in the center of the professional discourse and provides them with the latest benchmarking used by the national architectural community when it comes to sustainability, design excellence and innovation.

Simulations Game

One full class is dedicated to a structured simulation game. Students are given an energy simulation file with finite options relative to building typology, building envelope, mechanical systems, window area, systems controls, shading, airtightness, lighting and dimming and ventilation strategies. Each option has a theoretical monetary impact on the project's budget. The team that achieves the lowest EUI with the lowest budget earns an extra credit towards their final grade. This process exposes teams to the simulation world and acts as a motivation to experiment on building performance through research and analysis.

Integration with studio

During the first part of the semester groups of 3 to 4 students work on site, climate, and regulatory framework analysis to arrive to a definition of goals for their projects using specific benchmarking tools and standards. Students continue with practicing feedback loop analysis methods using validated daylight and energy modeling. Following a series of exercises in the form of assignments, they develop their individual studio designs and establish correlations between their analysis and their initial goals. At the end of the semester, they are asked to individually present their studio project through the prism of the research and analytic work they performed in this class. Students develop informative graphical representations of their analytic methods, a process that empowers them with the skills to assess the performance of their design as it relates to its climate responsiveness, energy preservation and human comfort.

3.1 PC 6 – Leadership and Collaboration

ASSESSMENTS AND BENCHMARKS

As a part of our assessment of Collaboration and Leadership, we build collaboration and leadership requirements into many of our courses. In collaborative studio projects, students are evaluated not only on the completion and success of their projects, but on their ability to work together. As a part of both grades and rubrics, we consider participation a central goal, which includes not only participation in the studio but engagement in collaborative activities.

We currently apply a number of assessment and benchmark criteria in our courses, with ambitions to strengthen and expand our assessment procedures in our evaluation of courses. Below, we explain the current approach to evaluation in the following classes:

In the B.Arch:
ARCH 3328 Technology 4
ARCH 4327 Technology 5
ARCH 4510 Architecture Design Studio VII

In the M.Arch:
ARCH 6376 Urban Determinants
ARCH 6603 Architecture Design Studio III
ARCH 6604 Architecture Design Studio IV

Architectural Design Studios 4501 (UG), 6603 (G), 6604 (G)

The architectural design studios 4501 in UG and 6603/6604 in G are structured to promote collaborative problem solving among the students, as well and opportunities for and understanding of leadership roles. Many of our projects are specifically collaborative in nature (through group- and team-based projects as well as whole-studio collaborations) and engage a diverse set of community stakeholders and advisors.

In the M.Arch studio courses ARCH 6603 and 6604, we currently use an assessment rubric based on a several criteria, with a scale of 1-5 in each area. One of these rubric areas is titled "Participation, Collaboration, and Leadership," and factors as 10% of the student grade for each semester. Our assessment of student engagement in this area is based on specific completion metrics and key performance indicators, such as:

- General student participation in class sessions, from studio crits to reading discussions to student presentations
- Demonstrations of effective collaboration skills to solve complex design and analysis problems
- Demonstrations of goal-setting
- Understanding of approaches to leadership within a design and architecture context
- Engagement with diverse stakeholders and advisors
- Engagement of dynamic physical and social contexts
- Initiative demonstrated in collaborative and academic tasks.

These performance indicators are evaluated based on a 0-4 scale by a collaborative team of faculty who guide the 6603/6604 studios. In the sample grading matrix below, we show "Participation, Collaboration, and Leadership" as a 10% grade overlay at the end of the semester. We do assess this element at the midterm as well, and then adjust at final assessment. We have found that this criterion is better assessed over the course of the whole semester, rather than on a step-by-step basis. Additionally, some factors regarding leadership and collaboration factor into the other four criteria depending on assignment type, especially Completion.

ARCH 660X LEVEL II GRADES

	Project 1.1 + 1.2					Project 2 Midterm							Project 2 Final							
STUDENT	Clarity	Craft	Completion	Construction	TOTAL	Clarity	Craft	Completion	Construction	TOTAL	MIDTERM TOTAL	MIDTERM GRADE	Clarity	Craft	Completion	Construction	TOTAL	PARTICIPATION, COLLABORATION, LEADERSHIP	FINAL TOTAL	GRADE
	3	3	3	2	2.75	3	1	2	2	2.00	2.38	C+	3	2	2	2	2.25	3.00	2.4	C+
	4	3	3	3	3.25	4	3	3	3	3.25	3.25	B+	4	4	4	3	3.75	4.00	3.6	A-
	4	4	4	4	4.00	4	4	5	4	4.25	4.13	A	5	3	4	4	4.00	3.00	4.0	A
	4	4	3	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	4	4	3.50	3.00	3.4	B+
	4	3	4	4	3.75	3	4	4	4	3.75	3.75	A-	5	4	4	3	4.00	4.00	3.9	A
	3	2	4		3.00	3	3	4	3	3.25	3.13	B	3	3	4	3	3.25	4.00	3.3	B+
	4	3	4	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	3	3	3.00	2.00	3.1	B
	4	3	3	3	3.25	3	3	3	3	3.00	3.13	B	3	2	3	3	2.75	2.00	2.8	B-
	2	2	1	2	1.75	2	2	1	3	2.00	1.88	C-	2	2	1	2	1.75	2.00	1.8	C-
	3	3	3	3	3.00	3	3	3	3	3.00	3.00	B	4	3	2	3	3.00	3.00	3.0	B
	4	4	3	3	3.50	4	3	3	3	3.25	3.38	B+	4	3	2	3	3.00	4.00	3.3	B+
	3	4	4	4	3.75	4	3	4	4	3.75	3.75	A-	5	3	4	3	3.75	3.00	3.7	A-
	4	4	4	3	3.75	3	4	4	4	3.75	3.75	A-	4	5	4	5	4.50	3.00	4.0	A

We encourage active participation and collaboration by all students. When students do not seem to be engaging, we often modify our approaches in order to create opportunities for collaboration and leadership. The goal would be that all students achieve a 3.0 or higher (on a 0-4.0 scale) in this area—we are not there yet, and will modify our assignments in the future to engage all learning styles.

Technology 4, 5

The technology curriculum in Tech 4 and 5 is organized to emphasize leadership roles the architect plays in the integrative design process to deliver high-performance, sustainable projects. This is organized through lectures that engage faculty and visiting professionals from various disciplines and multiple site visits to projects under construction. Through reading and class discussion, we emphasize the leadership role architects play as coordinators of processes ranging from the owner's program requirements to the realization of operations. We also discuss leadership extensively in the operation applications where design decisions support the integrated design process and focus on life-cycle performance. We review key performance indicators of design and operations that enhance both the community and facility users' well-being. These are documented in end of semester dossier deliverables.

We discuss collective team design and delivery accountability as well as the means through which energy, water, and site design measure success. Additionally, we review the contractual design partnerships the architect has with the client and the partnership the design professional has with the contractors. These curricular topics are documented in exams.

Collaboration and leadership are distinct attributes of the technology sequence with students working in teams for project delivery at the end of the semester. In Tech 4, student teams are organized to evaluate building systems over the course of a semester. As part of that evaluation students in Tech 4 also work in groups on a virtual reality design build project. Initially based upon virtually recreating a realized building's exterior envelope the process, through internal assessments, was modified and structured to incorporate the envelop assembly of the concurrent 3501 studio project. While growing in relevance and collaboration that virtual reality design build aspect of the Tech 4 curriculum was postponed and converted to a 2D wall section approach as students were not able to use the virtual reality headsets as a part of university wide pandemic protocols. In Tech 5, integrated with 4510 studio-based teams, students focus on project delivery, the ecological footprint of construction and materials, and investigations employing group problem solving.

In the Tech 4 and Tech 5 classes the rubric below has been incorporated for many years. It forms the basis for establishing initial objectives and provides benchmarks for both student internal assessments and faculty evaluation. This rubric was developed in the inception of the reassessment of technology as an integral component within studio curriculum and in professional development. It's five fields of performance focus, then ranked with five levels of delivery, were also instrumental in the technology review for 5th year student application via portfolio. This rubric has bene used in both technology capstone classes throughout the semester: with regular discussion of expectations and grading via the five categories students had a fast assessment of the level of their performance. We are considering applying this across all of the technology sequence.

SCORING RUBRIC FOR WEEKLY CASE STUDY ASSIGNMENTS – BUILDING SYSTEMS INTEGRATION						
ARCH 4325 UHCoA	Some representative example characteristics for each standard. Compare your work and scores to these standards					
Criterion	**0-Unnacceptable THE CAVE**	**1-Faulting THE HUT**	**2-Developing THE SHACK**	**3-Expected THE HOUSE**	**4-Better LE' CHATEAU**	**5-Superior IVORY HALLS**
CRITICAL THINKING- includes analysis, synthesis, and evaluation. Shows depth of insight into research issues and their relevance.	Does not address the assigned work or the thinking essential to its completion, adopts thinking that is obvious, engages in bias or strictly personal beliefs	Shallow thinking, major flaws in reasoning, poor engagement of research concepts, some unsupported statements, summarizes rather than analyzes or synthesizes	Some minor flaws in reasoning or extrapolation, logical fallacies and poor reasoning undermine the outcome, dismisses alternative views	Demonstrates clear thinking and application of research concepts, includes broad range of evidence, discerns facts from opinions, recognizes contextual factors	Uses insightful thinking in application of research concepts and issues of application, exceeds expectations by thinking beyond requirements of assignment	Clearly identifies the challenges of the work, recognizes subsidiary, embedded, or implicit aspects of related issues and complexities inherent in the assignment
DEVELOPMENT- ideas, thoughts and details are well-developed… demonstrates reflection, novel thinking, and grasp of concepts relevant to this work	Misapplication of key concepts, rote thinking and effort… major confusion is evident… generalizations made without support, cites irrelevant evidence	Low level of metacognitive thinking and reflection, lack of creative development, little cohesion between the separate parts of the work	Overstates or understates issues without adequate reasoning, over-reliance on assumptions, poor use of citations	Development of major points are clear, novel, and sound… a fundamental grasp of key concepts is demonstrated, uses citations well	Convincing work that engages the reader, invokes ideas from published literature and seminal examples of past research	Takes risks beyond ordinary expectation of assignment and opens up new avenues of exploration for the research project
RESOURCES- uses tools and methods of inquiry to full advantage… shows effort and persistence as well as creativity and unique results	Fails to adequately draw on the many modes of architectural thinking and literature relevant to the work	Uses resources without adequately evaluating their appropriateness, weak use of sources and citations	Restricted use of a narrow range of tools, some tools or methods maybe misused or weakly employed	Identifies and utilizes a wide range of resources appropriate to the work, methodologically sound, exemplifies creative effort, produces novel outcomes	Employs thinking across multiple disciplines or modes of thought, advanced application of tools and methods	Unique and novel work based on creative use of sources and citations, methodologically strong, demonstrates extensive and in-depth use of tools
COMPLETENESS- Length is appropriate to content, goals of assignment are addressed, format complies to requirements	Work is substantially incomplete, or does not meet many key criteria of assignment	Effort is poorly focused or misdirected, misses some aspects of the intended purpose of the task as assigned	Addresses purpose of the work, but may fail to respond to minor aspects of the assignment	Responds to all the criteria and goals of the assignment, establishes significance or purpose of the task in larger context	Exceeds the criteria and goals of the assignment, takes risks and thinks creatively	Synthesizes evidence, integrates sources, articulates views and perspectives at a high level
MECHANICS- Well written, graphically compelling, clear organization, uses standard English grammar, contains minor, if any, spelling errors	Does not meet college level writing standards or TOEFL requirements for English writing, lacks fluency	Inadequate organization or grammar, frequent spelling errors, repetition, contains empty statements or excessive amount of common knowledge	Clear and logical but some problems with legibility, grammar, or spelling… some minor problems with flow and fluency	Well written and well organized, very few errors in grammar, spelling, or syntax… clearly legible	Voice, tone, and formality are consistent and well suited to purpose… awareness of reader's needs and expectations	Exemplary writing worthy of publication, creative and innovative craft, broad command of vocabulary and language

FUTURE DEVELOPMENTS AND BENCHMARKING

The UHCoAD Architecture program is always looking to improve student leadership and collaboration. We see several ways of achieving this goal. The program will expand its engagement with diverse stakeholders within the larger university and the broader community. It will promote student collaboration and create opportunities for leadership and initiative on the part of students. Our projects always strive to create conditions in which students use collaborative problem-solving skills—we will ensure that this goal is embedded in our courses. Moving forward, we anticipate a greater number of interdisciplinary offerings both in the College and through partnering with other disciplines at UH. We would also like to work more directly with local communities on their most pressing needs.

To improve our assessments and benchmarks of these goals into the future, we plan to implement specific, measurable collaboration and leadership criteria across the curriculum. These will become a part of our grading rubrics and performance indicators. The specific criteria may vary from class to class depending on curriculum, and will generally include:

- Understanding of approaches to both leadership and collaboration.
- Engagement of diverse community representatives and stakeholders in the design process.
- Use of multidisciplinary teams.
- Application of effective leadership and collaboration skills to solve complex problems.

- Demonstrations of leadership and initiative in engagement and problem solving.
- Engagement of dynamic physical and social contexts.
- Ability to discern the valuable roles, key players, and skill sets in architecture and related disciplines.

For appropriate projects, the rubrics will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

Technology 4, 5

Future tech sequences under consideration include an increased focus on the architect's role in community advocacy and leadership, with guest speakers from appropriate professional disciplines providing specific insights. Additionally, understanding the evolution and integration of community input and the implications of community representation in the design process is part of future content envisioned in the methods / Tech 5 class.

Architectural Design Studios 4501 (UG), 6603 (G), 6604 (G)

Future 6603/6604 studios will be structured to create collaboration. For instance, our Spring 2022 studio is focused on “housing in transition.” Students will work actively with non-profits and agencies that find or build housing for currently transitional or unhoused populations in Houston. The goal is for our students to understand and work with diverse user groups collaboratively, to understand the human context and needs of populations they might not otherwise interact with.

In addition, across the three sections of the 6604 studio, groups of students will collaborate on housing designs for specific user groups (ex: elderly housing, housing for the mentally ill, housing for women and/or families). Students will be encouraged to create collaborative approaches to analysis and design. This enhanced collaboration will factor as a central component in our rubrics for Completion and Participation, Collaboration, and Leadership.

3.1 PC 7 – Learning and Teaching Culture

BARCH
ARCH 1500 – Architecture Design Studio I

MARCH
ARCH 6603 – Design Studio III (MARCH +2)
ARCH 6600 – Design Studio I (MARCH +3)

Stated in our College Culture document, the Gerald D. Hines College of Architecture and Design strives to empower ethical and critical thinkers who understand the power of design to shape our physical and social

environment, are skilled at their craft, and assume leadership roles within their chosen professions. The College provides an educative environment in which students negotiate the complexities of contemporary design practice and of sociopolitical issues. Each member of the College shares responsibility in upholding these values. In College-wide meetings, and daily in studio and in class, one is reminded through word and action that demonstrating mutual respect—such as through compassion for others' lived experiences and professionalism in communication, even in matters of conflict—is integral to fostering a positive and powerful learning environment. All members of our community are encouraged to contribute to the vibrancy and intensity of the work and discussion. Success is measured by the quality of discourse and the design process, as well as by the quality of work produced. Students are encouraged to engage with critique from their faculty and peers to further contribute to design discourse. Our College embraces students as full partners in their education. We approach critique as a collaborative and constructive practice to create proactive, critical, and optimistic contributors to our design disciplines.

In each of the inaugural Studio classes, students are introduced to the Studio Culture Document which is discussed, and they sign as a literal and ritual contract as a member of our community and a commitment to all of its values.

In faculty meetings (at least one each semester), and student town halls (as needed during each semester), we gather feedback from faculty and students on the status of our teaching and learning culture. These critiques are assessed, and changes are implemented if necessary.

In committee meetings (Undergraduate, Graduate) and taskforce meetings (DEI, College Culture), issues pertaining to teaching and learning are looked at in detail. Changes and improvement measures are discussed and implemented after all aspects of the issue at hand have been taken into consideration.

Student evaluations, collected at the end of each semester, are an additional valuable source of information. Staff members will voice their concerns and proposals during staff meetings each semester, and they are also encouraged to approach their supervisor directly. Our College Culture Statement addresses staff as part of the larger community.

The doors to the Dean's office are always open and dialogue is encouraged. The faculty is approachable during and after class to hear suggestions from students.

ASSESSMENT

In order to develop a data-based assessment process of student learning objectives we are developing an assessment rubric that will be used during the periodic evaluation across courses:

In the B.Arch. and the M.Arch.

We believe in the development of a Teaching and Learning Culture in every course and academic interaction. As a result, embedded in each course assessment will be specific questions that look at how those microcosmic interactions aid and facilitate these ambitions. Additionally, an annual survey to all faculty, students, administration, and staff will allow for a macrocosmic picture. These results will be addressed during the faculty meetings with periodic dedicated retreats assessing the teaching and learning culture in all facets.
In each course, the rubrics containing the following questions (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each

course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch. and M.Arch. degrees respectively.

Initial evaluation points relative to coursework assignments will include:
-How the program fosters a positive environment
-How the program fosters a respectful environment
-How the program ensures a positive environment
-How the program ensures a respectful environment
-How the program ensures encourages optimism
-How the program ensures encourages respect
-How the program ensures encourages sharing
-How the program ensures encourages engagement
-How the program ensures encourages and innovation

Asked of faculty, students, administration, and staff.
-student being broadly educated
-student valuing lifelong inquisitiveness
-student communicating graphically in a range of media
-student assessing evidence
-student comprehending people, place, and context
-student recognizing the disparate needs of client, community, and society

For more material see also **Files Folder College Culture_Material** and PC and SC narratives

3.1 PC 8 – Social Equity and Inclusion

PROGRAM APPROACH TO SOCIAL EQUITY AND INCLUSION

The University of Houston is one of the most diverse research institutions in the United States. In 2019, 42% of UHCoAD students identified as Hispanic or Latinx, 7% as Black or African American, 17% as Asian or Asian American, 23% as white, and 11% other.

Our College strives to uphold values of social equity and inclusion in our work and teaching. Our approaches to these issues are evolving and deepening. Many of our programs, centers, and courses already address questions of social equity and inclusion directly—in terms of our engagement with the Houston community and with our own students and faculty—albeit in a non-systematic and ad hoc way. We are working to develop a more systematic framework for social equity and inclusion, as we describe below.

As examples, the Community Design Resource Center (CDRC) works actively with local communities on issues of equity and inclusion as a core part of its mission. It has provided expertise on community engagement and planning to the City of Houston Planning and Development Department. The CDRC lead the planning process and wrote each of the Action Plans for the ten Complete Communities, including Third Ward.

Several of our existing History, Theory, and Criticism courses engage the historical and theoretical aspects of equity and diversity—including large course sections on American land use planning, race and architecture in America, colonialism, the urban ramifications of slavery and racism, and many related topics. Recent studios have also addressed the architectural and urban implications of social equity (or its historical lack) with projects centered on race and urbanism; historical preservation of cultural sites; engagement with diversity and diaspora; and local communities grappling with the effects of negative land use policy, development, and gentrification; among many other issues.

We have an active and engaged student body, with several student governance and participation organizations dedicated to improving our College's approach to issues of social equity and inclusion. Many of our faculty bodies and committees are also committed to increasing the diversity and equity included in our College, through faculty searches and policy changes with inclusion at their core. Recently, faculty and students have formed a joint task force and other groups in order to improve our College's approach to diversity, equity, and inclusion, as we describe below.

Following the Black Lives Matter movement, the Office of the Dean created the Diversity, Equity and Inclusion Task Force (DEITF) in June 2020. The assessments and data outlined in the task force final report were collected after the distribution of a Diversity, Equity, and Inclusion Survey that went to the College's faculty, staff, students, and alumni in September 2020. In addition to the quantitative and qualitative data collected from the survey, the DEITF also gathered information and perspectives from various College and community stakeholders through a series of focused meetings and dialogue sessions. The totality of the survey results and these conversations along with data from the UH Statistical Handbook, NAAB criteria, and other information shaped the report.

The taskforce looked at the entirety of the program, including the College, student experience and support, curriculum, faculty diversity, and surrounding community. Within each section, three subsections are included: "Context for Change," "Where We Stand," and "Goals and Recommendations." The "Context for Change" sections provide a broad overview and the "Where We Stand" sections provide important context and data points to facilitate a clearer understanding of associated issues that will allow the reader to better understand the DEITF's recommendations which include goals, action steps, and metrics to measure success going forward.

On May 2021, Dean Patricia Oliver appointed a Diversity, Equity & Inclusion (DEI) Action Task Force charged with facilitating the implementation of as many of the recommendations included in the December 2020 DEI Task Force Report as possible, and as soon as possible. The Action Task Force, which includes faculty, staff, and students from all the programs in the College, worked during the Summer of 2021 to review all 45 recommendations from the original task force. A survey was sent to all faculty, staff, and students to prioritize the 45 recommendations.

One of the first recommendations to be implemented was the organizing of a Community Round Table focusing on the Third Ward with the goal of encouraging collaborations between neighboring community organizations and UHCoAD faculty and students. The event took place at the UH Architecture Building on 21 July 2021—all of the College's faculty and students were invited. The program featured a presentation of the "Third Ward Complete Communities Action Plan" by Sasha Marshall of the City of Houston Department of Planning & Development.

1.1 B.Arch Program Approach to Social Equity and Inclusion

Our undergraduate B.Arch program is diverse even by the standards of our already diverse University, with many international and first generation students. The program prides itself on its support for and integration of students into its programs and planning, and actively encourage dialogue among all constituencies and stakeholders in the college. A number of our studios deal explicitly with questions of social equity, inclusion, and diversity—with many design problems engaging the historically black Third Ward in which the University of Houston sits. Our History/Theory/Criticism curriculum also offers

numerous courses addressing social equity and inclusion, with some entirely focused on the history of these issues in the architectural discipline (such as Azra Dawood's 2019 course "Architecture's Others") or on the centrality of a social equity approach to urban development (such as Susan Rogers' "Urban Determinants" course). Numerous other courses offer sections devoted to minorities in practice, land development as it pertains to diverse populations, and global histories of architecture emphasizing diverse traditions, among many other related subjects.

We have an active and open student government and strive to include students and staff on most faculty committees, where they have the ability to directly engage in questions about the future of the CoAD. The involvement of students has increased in recent years, and an upcoming revision to the College's bylaws will seek to give students greater inclusion, equity, and voice.

1.2 M.Arch Program Approach to Social Equity and Inclusion

As with the UHCoAD undergraduate program, the M.Arch comprises a diverse student body, with many international and first-generation students. We strive to include students in the planning and evolution of our programs, and encourage active dialogue. In terms of coursework in the M.Arch program, several studios in recent years have engaged directly with social equity and inclusion.

The current ARCH 6604 studio is titled "Homefulness" and is sited in the historically-black Third Ward. Its program is small-scale mixed-use social housing. All three of the studio sections address housing for economically disadvantaged and/or houseless groups, with each also raising an additional social question: aging; disability; and gender. We are working with community groups and local housing agencies in order to create direct dialogue between students and stakeholders. The studio will work "inside-out" so to speak, beginning with the design of single housing units catered to specific user needs, before expanding outward to questions of surroundings, community, urbanism, and the environment.

Previous ARCH 6603/6604 studios have been thematically diverse: a new mixed-use market hall for climate-affected communities in New Orleans that can, in times of weather crisis, shift to a refuge space; a studio titled "Diaspora," with a constellation of proposed community centers narratively constructed around the many diverse enclaves within the city of Houston, and their global networks; a studio titled "Elements" that addressed access to public and civic space within the city of Austin; among other programs.

Our graduate-level History, Theory, and Criticism curriculum is directly structured around issues of social equity and inclusion. A required course for graduate students is ARCH 6376 Urban Determinants. The course expands student's understanding of the political, economic, social, historical and spatial foundations of urban processes, practices, and policies to further their knowledge of the factors that have historically and presently shape the design and development patterns of cities. A broad selection of readings by diverse authors introduce students to urban policies, development practices, and design movements, and the often disparate impact of each on people and place. Annually, student evaluations are reviewed and completed coursework analyzed as a means to inform revisions and updates to the syllabus. Syllabus and content revisions also work to capture the most pressing contemporary issues facing the design professions and the human impacted environment. Over the last five years this has included expanding selections on climate change, resilience, redlining, and social equity and inclusion, as well as expanding the cultural contexts for study and analysis with an increasingly global perspective. Further, the required coursework is framed to encourage students further understanding of the city and how it is shaped. For example, the Reflecting/Seeing assignments ask students to look at the city around them in relation to the course content and think critically about it, its history, organization, policies, places, architecture, injustices, equity through both short essays and graphic content.

2. ASSESSMENTS AND BENCHMARKS—SOCIAL EQUITY AND INCLUSION

As described above, many of our current courses and programs engage issues of social equity and inclusion. However, we do not currently have a systematic approach for assessing and evaluating these approaches. With the establishment of a

joint DEI Task Force (which has now been approved by the Faculty to be included as an active standing committee) we expect to develop a more comprehensive approach.

Regarding coursework, our initial assessment points will include:

- understanding of social equity
- understanding of inclusion
- understanding of cultural contexts
- understanding of social contexts
- equitably support and include people of different backgrounds, resources, and abilities.
- understanding of cultural diversity
- understanding of the diverse needs of different cultures and individuals
- understanding of the diverse values of different cultures and individuals
- understanding of the diverse behavioral norms of different cultures and individuals
- understanding of the diverse physical abilities of different cultures and individuals
- understanding of the diverse social and spatial patterns of different cultures and individuals
- understanding the responsibility of the architect to ensure equity of access to sites, buildings, and structures

3.FUTURE DEVELOPMENTS AND ASSESSMENT APPROACHES

Moving forward, UHCoAD actively seeks to increase our faculty representation of minorities and women. We are undergoing a number of faculty searches at the moment, in which we're working with the University and with organizations such as the National Organization of Minority Architects to guarantee that our search committees follow the best practices for equitable hiring. We are advertising those positions in diverse venues in order to ensure a broad pool of applicants.

Our College also recently approved the addition of a permanent DEI standing committee, whose role will be to assist UHCoAD in its policies and procedures with respect to diversity, equity, and inclusion for faculty, staff, and students. One task of that committee will be to make recommendations regarding policies and communication protocols so that all parties and groups within the College have a voice and a role to play. The DEI committee will also help faculty to plan diverse course and studio offerings.

In the next year, we will be rewriting the UHCoAD Bylaws to include the DEI standing committee and to update our internal operations in order to guarantee broad participation, equity, and involvement. One task is to ensure the central participation of students and faculty at all levels in decision making for the College.

For more material see also **Files Folder DEI_Material** and PC and SC narratives

3.2 SC 1 – Health, Safety and Welfare in the Built Environment

In order to develop a data based assessment process of student learning objectives we are developing an assessment rubric that will be used during the evaluations of the courses:
In the B.Arch:

Focused on the performative and professional aspects of health, safety and welfare in the built environment relative to architecture
ARCH 3328 Technology 4
ARCH 4327 Technology 5

Focused on the integrative and design synthesis of these topics of health, safety and welfare in the built environment relative to architecture
ARCH 3230 Programming & Building Regulations
ARCH 4510 Architecture Design Studio VII

Standard in each course, the rubrics containing the following questions (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

Initial evaluation points relative to coursework assignments will include:
-understanding the impact of the built environment on human health,
-understanding the impact of the built environment on human safety, and
-understanding the impact of the built environment on human welfare
-mastery at multiple scales, (building to city)
-understanding codes and regulations
-understanding how to design sites, facilities, and systems that are responsive to relevant codes and regulations
-understanding the principles of life-safety
-understanding the principles of accessibility standards

Specific course detail is as follows:

ARCH 3230 Programming & Building Regulations
Description
ARCH 3230 (Programming and Building Regulations) is a third-year lecture course which introduces architecture and interior architecture students to basic life and safety building codes, regulations, and standards; the principles that underpin these codes and their implications for the design process. The course anticipates the 4510 Integrative Design Studio that students will take in the Fall of their fourth year in which they must demonstrate an understanding of basic life-safety principles and building codes. Programming and Building Regulations provides students with an overview of these codes at the local, state and national jurisdictions including occupancy classifications; fire-protection codes and standards focusing on means of egress and fire-stair width requirements; plumbing fixture requirements; and handicapped accessibility. Students are expected to demonstrate a basic understanding of the requirements to create a safe building and establish performance and design criteria for the architectural design process through the development of a pre-design document based on a case study program/site. Students are encouraged to keep their programming documents as a reference for the 4510 Integrative Design Studio.

Approach
The course is delivered semi-weekly through a series of curated presentations by invited faculty and local professionals that support the development of the students' programming documents. The human experience of architecture including human health, safety, and welfare concerns are explicitly addressed in these lectures. Beyond basic life safety issues, these lectures address human comfort and sustainability. Topics include client values, building regulations, fire-safety codes and egress systems, handicapped accessibility, and the integration of mechanical and structural systems. These lectures are supplemented with a follow up tutorial on the second weekly meeting day that reviews assignments based on those lectures. The course information is organized into four sections:

Underpinning Philosophies
client's values and mission, goals, beliefs, and desires

designer's philosophies and approach

Project Factual Information

integration of structural and mechanical systems
programmatic spaces
building codes and regulations
life safety and handicapped accessibility

Analysis

site physical, social and cultural context; site constraints, setbacks, easements
programmatic spatial and formal relationships
site/program integration possibilities

Generative Potential of Programming in Contemporary Practices

Assessment and Benchmarks

Students are assessed primarily on a submitted programming document (75%) and attendance (25%) with bonus points offered for class participation. Assessment takes place over the course of the semester through the weekly review of a samplings of submitted assignments. These assignments are compiled over the course of the semester to create the programming document. Students are given a rubric for each assignment which is used as a guide in an instructor-led weekly review of assignments. A question-and-answer period following this weekly review allows students to address specific questions about their own assignments which they are encouraged to revisit and improve. We proactively seek feedback on what students understand and what needs additional explanation or clarification. If there seem to be specific problem areas for the class, the materials from those sections are reviewed during tutorials. Students are allowed to correct and refine assignments over the course of the semester before submitting the final document. Quantitative assignments such as calculated net occupancy, required plumbing fixtures, and stair widths are graded with a standardized grade sheet. More qualitative assignments such as site analysis are graded on graphic clarity/refinement, completion, and intellectual depth. Submitted documents in any given semester are compared to programming documents submitted in previous years. We look for problem areas in the final documents and seek to emphasize and clarify explanations in those areas in the following year. We also review design proposals from the 4510 Integrative Design Studio to better understand what areas students may need more reinforcement in Programming and Building Regulations.

Evidence

We provide the course syllabus as well as student programming documents to the NAAB visiting team as evidence of the students' introduction to life-safety issues.

Future Developments

We actively seek to stay current with ever evolving building regulations/codes as well as technology that can affect the occupant's life safety and wellbeing. We are currently collaborating with a programming instructor at Ball State University to help improve our approach to teaching Programming and Building.

ARCH 4510 Architecture Design Studio VII

Approach

The comprehensive (integrated practice) level studio in the undergraduate program is ARCH 4510 Integrated Architectural Solutions. It seeks the integration of the architectural idea with building materials and systems that express that idea at a conceptual level. Spatial qualities and architectural form must be informed by the selection of structural, environmental, material assembly systems, and the character of natural light as influenced by the context, site, and program early in the design process. Further design determinants include egress and life safety, accessibility, and building regulations all of which must be understood by the students at the beginning of the design process.

ARCH 4510 is coordinated with ARCH 4327: Technology 5 which is taught during the same semester to the same student

cohort. ARCH 4327 focuses on six technology components that address health, safety and welfare: owner's program requirements, site orientation and climate, structure, envelope, materials, and heating/ventilation/air conditioning. These organize its syllabus and also are directly reflected in the requirements for ARCH 4510.

Assessment and Benchmarks

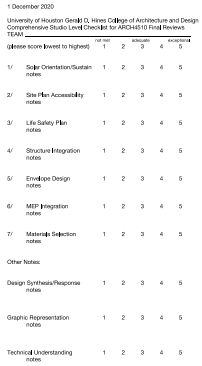
Upon the appointment of a new coordinator for ARCH 4510 in advance of the Fall 2020 semester, we implemented a new assessment rubric that is used at midterm and final reviews to capture quantifiable data. We piloted this rubric at the midterm and final reviews of Fall 2020 with no benchmarks in place for that first semester of use.

For our second semester of use during the Fall 2021 semester, we used the same rubric but set quantifiable benchmarks for the outcomes for both the midterm and final reviews. The criteria include the aspects of health (solar orientation and sustainability), safety (life safety plan), welfare (envelope, materials, and integration of mechanical, electrical and plumbing systems). The rubric has ten items, each of which was scored for each (two-student) collaborative design team on a scale from 1 to 5 (1 being the lowest and 5 being the highest). The assessment was provided by faculty and external guest participating in the midterm and final reviews.

Using our assessment tool, we set benchmarks for Fall 2021 to be that that 75% of the class (of all ARCH 4510 students) would receive at least a 60% at midterm review and 75% would receive at least an 80% at final review. We are currently undergoing the analysis of the Fall 2021 data set.

Evidence

Fall 2020 Rubric

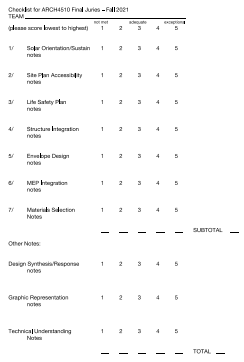


1 December 2020

University of Houston Gerald D. Hines College of Architecture and Design
Comprehensive Studio Level Checklist for ARCH4510 Final Reviews
TEAM _____

		not met		adequate		exceptional
(please score lowest to highest)		1	2	3	4	5
1/	Solar Orientation/Sustain notes	1	2	3	4	5
2/	Site Plan Accessibility notes	1	2	3	4	5
3/	Life Safety Plan notes	1	2	3	4	5
4/	Structure Integration notes	1	2	3	4	5
5/	Envelope Design notes	1	2	3	4	5
6/	MEP Integration notes	1	2	3	4	5
7/	Materials Selection notes	1	2	3	4	5
Other Notes:						
	Design Synthesis/Response notes	1	2	3	4	5
	Graphic Representation notes	1	2	3	4	5
	Technical Understanding notes	1	2	3	4	5

Fall 2021 Rubric



Checklist for ARCH4510 Final Juries – Fall 2021
TEAM _____

		not met		adequate		exceptional	
(please score lowest to highest)		1	2	3	4	5	
1/	Solar Orientation/Sustain notes	1	2	3	4	5	
2/	Site Plan Accessibility notes	1	2	3	4	5	
3/	Life Safety Plan notes	1	2	3	4	5	
4/	Structure Integration notes	1	2	3	4	5	
5/	Envelope Design notes	1	2	3	4	5	
6/	MEP Integration notes	1	2	3	4	5	
7/	Materials Selection Notes	1	2	3	4	5	
		__	__	__	__	__	SUBTOTAL __
Other Notes:							
	Design Synthesis/Response notes	1	2	3	4	5	
	Graphic Representation notes	1	2	3	4	5	
	Technical Understanding Notes	1	2	3	4	5	
		__	__	__	__	__	TOTAL __

Future Developments

The rubric offered helpful feedback to the faculty and students but proved difficult for guest reviewers to complete while also interactively reviewing the projects and participating in a discussion with the students. In addition, we have found it difficult for the faculty to consistently retrieve the assessments after completion due to the voluntary role of these reviewers.

We have learned that the assessment process needs to be separated from the interactive design review process so that the assessment may receive the focus that it deserves. We plan to hire a team of outside experts to conduct the assessment so that the team members will be accountable for completing the assessment task. For Fall 2022, the assessment rubric will be revised from a 5-point scale to a 10-point scale so that it aligns with assessment tools developed for the 2501, 3500 and 3501 studios. This will create greater consistency with the use of the assessment tools throughout the undergraduate program and foster greater familiarity within the student body and faculty team.

In the M.Arch:

Focused on the performative and professional aspects of health, safety and welfare in the built environment relative to architecture
ARCH 6A48 Environmental Technology 3
ARCH 6A49 Environmental Technology 4

Focused on the integrative and design synthesis of these topics of health, safety and welfare in the built environment relative to architecture
ARCH 6603 Architecture Design Studio III
ARCH 6604 Architecture Design Studio IV

In each course, the rubrics containing the following questions (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

Initial evaluation points relative to coursework assignments will include:
-understanding the impact of the built environment on human health,
-understanding the impact of the built environment on human safety, and
-understanding the impact of the built environment on human welfare
-mastery at multiple scales, (building to city)
-understanding codes and regulations
-understanding how to design sites, facilities, and systems that are responsive to relevant codes and regulations
-understanding the principles of life-safety
-understanding the principles of accessibility standards

Arch 6603/6604 Assessment and Benchmarks for Health, Safety and Welfare

The ARCH 6604 studio in the Graduate Program is our Building Integration studio—which we title Synthesization. The goal of this studio is to integrate architectural concepts and ideas with building systems, codes, and materials. Students learn that questions of architectural form and space must be underpinned by a firm grasp of structural and environmental systems, material assemblies, and an application of codes, life safety, egress, program, and other elements related to the welfare of occupants.

ARCH 6604 is coordinated with ARCH 6A49: Environmental Tech III and ARCH 6A51: Construction Tech which are taught during the same semester to the same student cohort. ARCH 6A49 focuses on a number of aspects of architectural design that specifically address health, safety and welfare: owner's program requirements, site orientation and climate, structure, envelope, materials, and heating/ventilation/air conditioning. These organize its syllabus and also are directly reflected in the requirements for ARCH 6604.

For several years in ARCH 6603/6604, we have used an assessment criteria broken down into three categories—Intellectual Clarity, Craft, and Completion. This year, at the suggestion of several faculty, we added a fourth category, Construction, specifically intendent to address issues of assembly, systems, safety, regulation, and codes. This four-part rubric was applied in the Fall of 2021 for the first time.

Our benchmarks for these four criteria include health (natural ventilation, daylighting, materials, access to open space), safety (MEP systems, egress, fire), and welfare (evident in the previous areas, and also in the selection of programs and sites having to do with issues of public concern.

The current assessment rubric in the M.Arch studio courses ARCH 6603 and 6604 is based on a several criteria, with a scale of 1-5 in each area. These elements are considered in addition to other assessment areas as a part of an overall grade. Regarding Health, Safety, and Welfare, ARCH 6603/6604 progresses from the broad scale of urban and cultural welfare, to specific questions of building mechanics, performance, and safety. We measure each student's ability to make decisions demonstrating both the integration and representation of:

- Site and Context Analysis (including Climate, Flora, Fauna, Geomorphology, Water)
- Integration of Public Welfare and Engagement with Diverse Communities
- Program Requirements and Pre-Design
- Regulatory Requirements (including Land Use, Zoning and Codes)
- Site Orientation and Climate Design Issues
- Structure from Foundation to Roof
- Accessibility
- Life Safety Systems
- Building Envelope (including Materials and Performance)
- Materials (including Embodied Energy and Life Cycle Costing)
- Environmental Control Systems (including Approaches to Shading and Natural Ventilation)
- Energy (including Renewable Energy Sources as a Primary Approach)

In each case, students compare and contrast their strategies with industry standards, in collaboration with their architect-instructors as well as with external engineers, code consultants, sustainability experts, programming consultants, and others. The feedback from these consultants is then folded into our student evaluations and grading processes, including a rubric. The questions in the rubric below are supplemented with specific faculty evaluations of students' approaches to the elements above:

GRADING RUBRIC ARCH 660X — Scale of 1-5

CRAFT		INTELLECTUAL CLARITY		COMPLETION		CONSTRUCTION	
Is the project attentive to questions of scale, space, proportion and atmosphere?		Are the contextual elements used in the project concept clear? (i.e. are history, culture, urban and geophysical context clearly referenced?)		Is the project represented in such a way that it is fully understandable?		Is the construction assembly of the project realistic in terms of architecture industry standards?	
Are digital and physical models well made? Do they indicate space, transparency, opening, solidity, and structure clearly?		Are the parti and massing elements in the project clear? Is there an apparent logic and sequence to how these elements were developed and how they interrelate?		Are the requirements and deliverables for the studio met?		Are building systems (structure, MEP, material etc) represented correctly through drawing, diagrams, and imagery?	
Are renderings and collages clear in their construction? Do they explain the architecture in terms of space, scale, proportion, light, and material?		Do the building systems (structural, atmospheric, material) follow from the project concept?		Do the drawings and images contain everything needed to accurately convey the project?		Are references made to industry standards in terms of construction, codes, and regulations?	
Do diagrams clearly explain how the project works?		Is the project as a whole legible? Do the individual parts, drawings, and images support the larger concept?		Was the student attentive to feedback and to revisions in the design process?		Does the student demonstrate an understanding of how their building would be assembled?	
Are the drawings well-crafted according to architectural standards? Are line weights and other drawing elements clear?		Does the project reference or make use of common understandings of architectural knowledge?		Did the student engage with the instructor and other students in a productive, collaborative way?		Do building systems in the project work together?	

These evaluations are compared to similar work performed in previous semesters and years. In these comparative evaluations, we look at the quality of both integration and representation. Through numerous semesterly meetings with the studio faculty and coordinator, we evaluate the integration of parallel sections as a singular team-taught unit—as well as conversations with the Director of Graduate Studies and the Graduate Committee. The curriculum is systemically reevaluated through the feedback loop of the micro and macro expectations. We actively seek student feedback on project types, workload, learning goals, and our own instruction. We also use industry standards as a continuous set of benchmarks—provided by both our instructors and our invited guests. Lastly, we examine the general state of discourse at other architecture schools to understand the pedagogical direction of the profession as well as the criteria and benchmarks used both nationally and internationally. We engage in assessment and course correction based on both guest and student feedback every semester.

The end result each semester is a grading matrix that takes these various evaluation methods into account. Here is an example:

ARCH 660X LEVEL II GRADES

	Project 1.1 + 1.2					Project 2 Midterm							Project 2 Final							
STUDENT	Clarity	Craft	Completion	Construction	TOTAL	Clarity	Craft	Completion	Construction	TOTAL	MIDTERM TOTAL	MIDTERM GRADE	Clarity	Craft	Completion	Construction	TOTAL	PARTICIPATION, COLLABORATION, LEADERSHIP	FINAL TOTAL	GRADE
	3	3	3	2	2.75	3	1	2	2	2.00	2.38	C+	3	2	2	2	2.25	3.00	2.4	C+
	4	3	3	3	3.25	4	3	3	3	3.25	3.25	B+	4	4	4	3	3.75	4.00	3.6	A-
	4	4	4	4	4.00	4	4	5	4	4.25	4.13	A	5	3	4	4	4.00	3.00	4.0	A
	4	4	3	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	4	4	3.50	3.00	3.4	B+
	4	3	4	4	3.75	3	4	4	4	3.75	3.75	A-	5	4	4	3	4.00	4.00	3.9	A
	3	2	4		3.00	3	3	4	3	3.25	3.13	B	3	3	4	3	3.25	4.00	3.3	B+
	4	3	4	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	3	3	3.00	2.00	3.1	B
	4	3	3	3	3.25	3	3	3	3	3.00	3.13	B	3	2	3	3	2.75	2.00	2.8	B-
	2	2	1	2	1.75	2	2	1	3	2.00	1.88	C-	2	2	1	2	1.75	2.00	1.8	C-
	3	3	3	3	3.00	3	3	3	3	3.00	3.00	B	4	3	2	3	3.00	3.00	3.0	B
	4	4	3	3	3.50	4	3	3	3	3.25	3.38	B+	4	3	2	3	3.00	4.00	3.3	B+
	3	4	4	4	3.75	4	3	4	4	3.75	3.75	A-	5	3	4	3	3.75	3.00	3.7	A-
	4	4	4	3	3.75	3	4	4	4	3.75	3.75	A-	4	5	4	5	4.50	3.00	4.0	A

Using our assessment tool, we set benchmarks for Fall 2021 to be that that 90% of the class (of all ARCH 6603 students) would receive at least a 70% at midterm review and 90% would receive at least an 80% at final review. The goal is to encourage improvement over the course of the semester, both in our teaching and in student performance

3.2 SC 2 - Professional Practice

In order to develop a data-based assessment process of student learning objectives we are developing an assessment rubric that will be used during the evaluations of the courses. The assessment criteria seek to acknowledge the nuances and multiplicity of interpretation of certain criteria, and thus will deploy an array of methodologies to determine if students are sufficiently fulfilling the assessment criteria:

In the B.Arch:

ARCH 4327 – Technology 5
ARCH 4328 – Technology 6

In the M.Arch:

ARCH 6A50 – Construction Technology 3
ARCH 6360 – Practice of Architecture
ARCH 6361 – Integrated Practice

Approach

The primary course that carries the load for the SC.2 Professional Practice criteria is the ARCH 4328 Technology 6 / ARCH 6360 Practice of Architecture course in the Undergraduate and Graduate program. All undergraduate and graduate students seeking an accredited degree must take this course. Supplemental material comes from ARCH 4327 Tech 5 in the undergraduate sequence and ARCH 6A50 Construction Technology 3 and ARCH 6361 Integrated Practice in the graduate sequence. As such, the following narrative primarily focuses on the Technology 6 / Practice of Architecture approach, benchmarking, and assessment methods. The Technology 6 / Practice of Architecture course is designed around the notion that the practice of architecture requires a deep understanding of 1) leadership, management, business, economics, regulatory, and legal contexts both nationally and internationally; 2) collaboration and communication practices that use design thinking as both the medium and process for achieving results; 3) ethical considerations in the discipline including issues of practice, labor, diversity, equity, inclusion, and access; 4) contemporary environmental, technological, and policy considerations in the practice of architecture. To that end, the course is designed to create immersive, engaged, and liberating pedagogical experience for students, curating course content towards applied knowledge, active debate, individual and group research assignments and projects, in-person experiences, and critical integration with core studio and technology curriculum content.

Self-Evaluation

The Technology 6 / Practice of Architecture course is taught by a team of two instructors and the course approach was the result of an in-house assessment process of the curriculum which took place over the course of 2020-2021. A Professional Practice Task Force made of a group of three faculty conducted the assessment of the course and proposed transformations beginning in the 2022 term. The task force began by compiling curricula from other Professional Practice courses from a variety of architecture departments across academies in the United States. A week-by-week comparison of the course content allowed the task force to get a better sense of how the University of Houston course could be calibrated in light of contemporary practical, ethical, and political conditions and in the context of accreditation criteria. The different formats for presenting and communicating information were also analyzed: panel discussions, reading debates, site visits, guest workshops, assignments, and projects provided insights into different pedagogical and methodological approaches. The comparative curricular analysis was shared publicly with UH Faculty, and the evaluation committee led an open conversation to seek feedback about the current Tech 6 / Practice of Architecture course at UH and how faculty members thought it could be adjusted in the future. The evaluation committee combined feedback from the faculty conversations and the knowledge gained from the curricular analysis in order to propose changes to the curriculum in terms of format, scheduling, teaching method, content, and approach.

Description

Transformation to the existing course description for the ARCH 4328 Technology 6 / ARCH 6360 Practice of Architecture are as follows. Tech 6 / Practice of Architecture is an undergraduate and graduate-level course dedicated to familiarizing students with the fundamental principles and contemporary discourse about profession and practice of architecture and adjacent disciplines today. The course challenges students to think critically about the architectural profession and develop new tools and techniques to assess and bring about change in the practice of architecture. The course will examine the complexities of the discipline—intertwined with broader global and local economic conditions, labor markets, political issues, and cultural representation—pushing students to grapple with the foundational ideas of what it means to be part of a “profession” and what the privileges and responsibilities such a distinction implies. The intent of the topics and methods is to help students assess and expand the agency of the architect towards a better future for policy, culture, technology, the built environment, and humanity. Crucially, the course is designed as a space of active engagement, collective discourse, and civic participation. The course content is specific but open to plural paths of inquiry, so that students can position themselves as agents of change within the curriculum and class structure. The Practice of Architecture course is one of the few places in the academy where issues of economics, ethics, equity, governance, civics, and activism surrounding contemporary practice coalesce and are open to debate.

The Practice of Architecture course meets one day per week for 3 hours and consists of lectures by instructors and invited guests, case studies, critical reading discussions and debates, individual research tasks, weekly workshops, and final group projects. Each class period will be divided into 3 parts for each 3 hour class:

First Hour: Lecture / Discussion - Each class will open with a lecture about a specific topic led by the instructors with selected invited guests, both visiting in-person or virtually. The lecture format will encourage class dialogue, debate, discussion, and questions throughout. Readings will play a crucial role in the content discussed in the lectures.

Second Hour: Group Workshop - Each session will feature a group workshop with approximately 20 teams each consisting of approximately 6 students per team. Each team will be assigned a sub-topic relative to the main lecture content. Individuals are required to complete a one page research document each week, intended to be completed during the class period and then submitted the following week. Individual student assignments from each workshop will be formatted with a shared template and assembled into a collective document which seeks to outline the contemporary conditions of the profession of architecture and adjacent industries: from economics to politics, equity to innovation, tactics to ethics. These tasks will help students situate themselves within the landscape of architectural production and imagine new modes of agency for design. Student groups will use this information to speculate and articulate their ideal mode of architectural production: challenging the industry and professional norms, and finding alternative structures of practice. These

assignments are categorized into the following types: 1) Researching specific subjects; 2) Answering critical questions; 3) Producing analytical diagrams; 4) Gathering specific data.

Third Hour: Group Report - To close the class, each team will present the research from the workshop, led by one person within each group to represent the team. Teams will alternate presenters each week and communicate content discussed with the team to the rest of the class. This should encourage debate and discussion among all groups and tie in readings from each week.

Final Project - Reflecting on the research the students have gathered during their tasks, explorations, and assignments built up throughout the course of the term, the course will culminate in a final project that will propose a project that challenges the status quo of the definition of what is in to be an "architect" in today's market and culture. The final project will instrumentalize these research agendas towards a Public Action. Again, working in teams 6 for the final 4 workshop sessions of the course, groups will design and deploy a strategic action that is tied to a real-world condition, group, or problem. This could take the form of a public conversation about a critical topic, presenting at a municipal meeting, starting an organization, submitting to an RFP, designing a business plan, starting a lobbying campaign, etc. The ultimate agenda for this project is to re-envision how practice works relative to the broader economic, political, environmental, and institutional structures of society.

Assessment and Benchmark

In each course listed above, rubrics containing the topics listed below will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by course faculty or external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. Documents for assessment will include quizzes, exams, assignments, research tasks, and final projects (more specific documents for assessment listed with each course below). Coursework and projects for assessment will focus on critical and nuanced comprehension of the topics listed, seeking to acknowledge the complexity and multiplicity of thought surrounding contemporary issues of project integration and professional practice.

The assessment process for the Practice of Architecture course will relate each of the topics below to a corresponding set of assessment templates for quizzes, research projects, case studies, discussion questions, and reading responses, as well as quizzes and exams in order to compare learning objectives and calibrate the ongoing development of each course. Scoring data as well as the research assignments and final projects will be collected and analyzed during each course cycle by the faculty, coordinators, directors, and administration. As an example, in each term of the Tech 6 / Practice of Architecture course, we will conduct a Path to Licensure workshop which will seek to expand the students' understanding of the process of licensure both at the city, state, and national level but also in international contexts. The students will be assessed for understanding with an in-class quiz on the content of the presentations and discussion. The benchmark will be that 80% of the class earns at least a 75% on the quiz. Importantly such benchmarking evaluations seek to examine students' understanding of both the governing bodies, regulatory contexts, and ethical considerations of the profession, but also to think critically about their implications on the Practice of Architecture. Based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

Future Developments

Long-term benchmarks include tracking of students seeking licensure, registration exam outcomes, and student responses to satisfaction surveys done by the development office that remain in the field of design practices years after graduation (as seen when they return for milestone years to the school). The goal of this long-term benchmark is to increase the number of licensed graduates each year, increase the pass rate for registration exams, and increase the speed of achieving licensure each year. Additionally, we will pilot a prototype for gathering feedback from both students and faculty to help continue integrating content from professional practice into the broader curriculum. Continuing the process started by the Professional Practice Task Force, this will include a series of questionnaires, conversations with faculty and students, as

well open events such as paths-to-licensure, alumni spotlights, workshops on professional equity and ethics, sustainability and practice, etc. Together, the documentation of these conversations, questionnaires, and events will be compiled to form a path to implement to implement change in the curriculum.

Assessment Topics and Material

In the B.Arch:

ARCH 4327 – Technology 5 asks students, individually or in groups, to submit a written exam, material specifications research document, and final presentation with detailed description and representation of studio projects showing owner requirements, zoning and code analysis and design, as well as interior organization, structural, façade, MEP, and systems coordination and design. Course faculty will assess student final submissions based on comprehension and understanding of the topics below.

- Owner Project Requirements
- Site and landscape strategy, planning, design, and coordination
- Understanding of code analysis and ethics including accessibility requirements, life safety, and egress
- Understanding of the implications of zoning
- Building envelope and façade coordination
- Structural analysis and coordination
- MEP and lighting strategies and consultant coordination
- Impacts of systems integration decisions on project timeline and budget
- Impacts of systems integration decisions on the environment and lifecycle of a building and site
- Clear communication using representation, documentation, and argumentation of above project components

ARCH 4328 – Technology 6 asks students, individually and in groups, to submit a cumulative research dossier, topical quizzes, final exam, and final project demonstrating comprehension of the conditions and complexities of the discipline of architecture—intertwined with broader global and local economic conditions, labor markets, political concerns, and cultural representation. Course faculty will assess cumulative research dossiers, quizzes, and exams, while final projects will be evaluated by outside critics based on comprehension and understanding of the topics below.

- Professional ethics
- Regulatory requirements
- The forces influencing change in these subjects
- The business of architecture and construction
- Legal and professional responsibilities
- Relationships among key stakeholders in the design process—client, contractor, architect, user groups, local community—and the architect's role to reconcile stakeholder needs.
- Methods for selecting consultants and assembling teams; identifying work plans, project schedules, and time requirements; and recommending project delivery methods.
- Basic principles of a firm's business practices, including financial management and business planning, marketing, organization, and entrepreneurship.
- The architect's responsibility to the public and the client as determined by regulations and legal considerations involving the practice of architecture and professional service contracts.
- The ethical issues involved in the exercise of professional judgment in architectural design and practice and understanding the role of the NCARB Rules of Conduct and the AIA Code of Ethics in defining professional conduct.

In the M.Arch:

ARCH 6A50 – Construction Technology 3 asks students to individually submit homework assignments, quizzes, a midterm, and final exam covering architectural structural systems and analysis. Course faculty will assess student homework, quizzes, and exams based on comprehension and understanding of the topics below.

- Load calculations and tables for various reinforced concrete and steel structural systems
- Long span roof structural systems and analysis
- Implications of foundation systems on site
- Application of structural systems to various building types, including office and residential buildings
- Implications on cost, material economy, sourcing, ethics, environment, and labor of each structural system
- Analysis and application of precedents to studio work
- Compare, evaluate, and communicate relative performance of structural systems based on economy, effectiveness, and function
- Relationship between architect, civil engineer, structural engineer, and client
- Responsibility of the architect in demonstration of structural analysis and solution
- Contemporary structural innovations, advances, and analytic tools / technologies

ARCH 6360 – Practice of Architecture asks students, individually and in groups, to submit a cumulative research dossier, topical quizzes, final exam, and final project demonstrating comprehension of the conditions and complexities of the discipline of architecture—intertwined with broader global and local economic conditions, labor markets, political concerns, and cultural representation. Course faculty will assess cumulative research dossiers, quizzes, and exams, while final projects will be evaluated by outside critics based on comprehension and understanding of the topics below.

- Professional ethics
- Regulatory requirements
- The forces influencing change in these subjects
- The business of architecture and construction
- Legal and professional responsibilities
- Relationships among key stakeholders in the design process—client, contractor, architect, user groups, local community—and the architect's role to reconcile stakeholder needs.
- Methods for selecting consultants and assembling teams; identifying work plans, project schedules, and time requirements; and recommending project delivery methods.
- Basic principles of a firm's business practices, including financial management and business planning, marketing, organization, and entrepreneurship.
- The architect's responsibility to the public and the client as determined by regulations and legal considerations involving the practice of architecture and professional service contracts.
- The ethical issues involved in the exercise of professional judgment in architectural design and practice and understanding the role of the NCARB Rules of Conduct and the AIA Code of Ethics in defining professional conduct.

ARCH 6361 – Integrated Practice asks students, individually or in groups, to submit a precedent research presentation and a final detailed design presentation which describes and represents studio projects considering all elements of enclosure systems including, but not limited to, foundation, structure, framing, sheathing, roofing, vapor barrier, waterproofing, doors, windows, insulation, façade and interior finishes. Course faculty will assess student final submissions based on comprehension and understanding of the topics below.

- Analysis and application of case studies applying structural, envelope or material strategies to projects
- Implications of design and systems integration decisions on building elevations, sections, structural system and floor plan
- Argumentation for selections based on evaluation of relative performance of technical systems configuration
- Demonstrate ability to move between construction documentation tools and representational tools
- Communication methods to illustrate complex systems and building analysis for client and consultants
- Demonstrate ability to identify appropriate structural, mechanical and material principles to address issues of sustainable resource allocation, energy use, climate change, and building performance
- Impacts of systems integration decisions and material decisions on the lifecycle of a building and site
- Financial considerations of selecting appropriate structural, mechanical and material systems

- Ethical considerations in building envelope and systems integration design and implementation in terms of economy, labor, and the environment
- Aesthetic considerations and limitations of various building assemblies.

3.2 SC 3 – Regulatory Context

SUBMITTED APR TEXT

SC.3 Regulatory Context—How the program ensures that students understand the fundamental principles of life safety, land use, and current laws and regulations that apply to buildings and sites in the United States, and the evaluative process architects use to comply with those laws and regulations as part of a project.

SC.3 PROGRAM RESPONSE

Courses Included in Response to SC.3:

BARCH

ARCH 3230 – Programing & Building Regulations
ARCH 3501 – Architecture Design Studio VI
ARCH 4328 – Technology 6
ARCH 4510 – Architecture Design Studio VII

MARCH
ARCH 6603 – Design Studio III
ARCH 6604 – Design Studio IV
ARCH 6360 – Professional Practice

1. PROGRAM APPROACH TO REGULATORY CONTEXT

Many of UHCoAD's core architecture classes address questions of life safety, land use, and laws and regulations as both an implicit and explicit element in our syllabi. Both the Level II graduate studios (ARCH 6603 and ARCH 6604) and several upper-level Undergraduate studios (ARCH 4510 and ARCH 5500) examine broad questions of land development at the early stages of design, incorporating local building codes, zoning,and other land use regulations. As design projects develop, specific code questions regarding ADA, life safety, and legal questions move to the fore. This is especially true of ARCH 4510 and ARCH 6604—our Integrated Architectural Solutions—where students must directly engage use and occupancy types, construction types, zoning and lot development regulations, accessibility, fire, and other life safety codes.

These questions are also addressed from a professional and legal perspective in our Technology sequence, through the undergraduate courses ARCH 3230 (Programming and Building Regulations) and ARCH 4328 (Technology 6) and the graduate course ARCH 6360 (Professional Practice). Our Tech courses are developed in coordination with Studio in order to allow for cross-fertilization of concepts. At several points during the semester, Tech and Studio faculty attend each other's classes and reviews in order to bring life safety, technical, and regulatory concepts directly to bear on studentprojects.

Upper-level studios often examine questions of land use in depth, such as ARCH 7602 with urban planner Bruce Race or ARCH 7601 with Rafael Longoria at the Graduate level. We offer a diversity of electives on questions related to urban planning, land use, and safety.

2. CURRENT ASSESSMENTS AND BENCHMARKS—REGULATORY CONTEXT

In order to assess students' engagement with questions of regulatory context, we rely both on our core faculty as well as invited design professionals to review work. We use design juries, pinups, desk crits, and presentations to give comprehensive feedback to our students. That feedback is recorded and submitted back to the students as a written narrative—they hear the information once in a spoken review, and then receive written notes afterward reinforcing the review comments. We also ask our reviewers to provide written notes after the review as a third point of learning. This feedback is incorporated into our grading rubric.

Faculty also frequently visit both built works and works under construction. In the Fall of 2020, some groups had the opportunity to tour both the Glassell School and the Kinder Museum of Fine Arts Houston by Steven Holl with the project architect Olaf Schmidt. Holl discussed questions of regulation in depth, describing the various ways in which the projects were obligated to meet life safety, code, and legal requirements.

ARCH 4510 Architecture Design Studio VII Assessment and Benchmarks for Regulatory Context

ARCH 4510 Integrated Architectural Solutions seeks the integration of the architectural idea with building materials and systems that express that idea at a conceptual level. Further design determinants include egress and life safety, accessibility, and building regulations all of which must be understood by the students at the beginning of the design process. In-class lectures provide an overview of the regulatory framework for the planning ordinances, parking codes, building codes, accessibility codes and, in some cases, historic district ordinances that pertain to the jurisdiction of the assigned building site. Through their designs students demonstrate their ability to apply these regulations and are assessed on their compliance with and correct interpretation of these regulatory forces.

ARCH 4510 builds on the understanding of regulatory context that each student gained in ARCH 3230 Programming & Building Regulations in the previous year. In ARCH 4510, each student's understanding that had been built up through case studies and typical examples in ARCH 3230 is applied and demonstrated in the design and development of an original building scheme.

Upon the appointment of a new coordinator for ARCH 4510 in advance of the Fall 2020 semester, we implemented a new assessment rubric that is used at midterm and final reviews to capture quantifiable data. We piloted this rubric at the midterm and final reviews of Fall 2020 with no benchmarks in place for that first semester of use.

For our second semester of use during the Fall 2021 semester, we used the same rubric but set quantifiable benchmarks for the outcomes for both the midterm and final reviews. The criteria include the aspects of health (solar orientation and sustainability), safety (life safety plan), welfare (envelope, materials, and integration of mechanical, electrical and plumbing systems). The rubric has ten items, each of which was scored for each (two-student) collaborative design team on a scale from 1 to 5 (1 being the lowest and 5 being the highest). The assessment was provided by faculty and external guest participating in the midterm and final reviews.

Using our assessment tool, we set benchmarks for Fall 2021 to be that that 75% of the class (of all ARCH 4510 students) would receive at least a 60% at midterm review and 75% would receive at least an 80% at final review. We are currently undergoing the analysis of the Fall 2021 data set.

Fall 2020 Rubric

1 December 2020

University of Houston Gerald D. Hines College of Architecture and Design
Comprehensive Studio Level Checklist for ARCH4510 Final Reviews
TEAM _____

		not met		adequate		exceptional
(please score lowest to highest)		1	2	3	4	5
1/	Solar Orientation/Sustain notes	1	2	3	4	5
2/	Site Plan Accessibility notes	1	2	3	4	5
3/	Life Safety Plan notes	1	2	3	4	5
4/	Structure Integration notes	1	2	3	4	5
5/	Envelope Design notes	1	2	3	4	5
6/	MEP Integration notes	1	2	3	4	5
7/	Materials Selection notes	1	2	3	4	5
Other Notes:						
Design Synthesis/Response notes		1	2	3	4	5
Graphic Representation notes		1	2	3	4	5
Technical Understanding notes		1	2	3	4	5

Fall 2021 Rubric

Checklist for ARCH4510 Final Juries – Fall 2021
TEAM _____

		not met		adequate		exceptional	
(please score lowest to highest)		1	2	3	4	5	
1/	Solar Orientation/Sustain notes	1	2	3	4	5	
2/	Site Plan Accessibility notes	1	2	3	4	5	
3/	Life Safety Plan notes	1	2	3	4	5	
4/	Structure Integration notes	1	2	3	4	5	
5/	Envelope Design notes	1	2	3	4	5	
6/	MEP Integration notes	1	2	3	4	5	
7/	Materials Selection Notes	1	2	3	4	5	
		__	__	__	__	__	SUBTOTAL __
Other Notes:							
Design Synthesis/Response notes		1	2	3	4	5	
Graphic Representation notes		1	2	3	4	5	
Technical Understanding Notes		1	2	3	4	5	
		__	__	__	__	__	TOTAL __

ARCH 6603/6604 Design Studios Assessment and Benchmarks for Regulatory Context

The ARCH 6603 studio in the Graduate Program is titled Contextualization, and engages directly with questions of urban and social context, urban design, and urban form. In this studio, we approach the regulatory context from the perspective of how architecture integrates with urban fabric. The 66044 studio is our Building Integration studio—which we title Synthetization. The goal of this studio is to integrate architectural concepts and ideas with building systems, codes, and materials. Students learn that questions of architectural form and space must be underpinned by a firm grasp of structural and environmental systems, material assemblies, and an application of codes, life safety, egress, program, and other elements related to the welfare of occupants.

ARCH 6603/6604 are coordinated with ARCH 6A48/6A49: Environmental Tech III and ARCH 6A50/6A51: Construction Tech which are taught during the same semester to the same student cohort. ARCH 6A48/6A49 focus on a number of aspects of architectural design that specifically address regulatory context: owner's program requirements, site orientation and climate, structure, envelope, materials, and heating/ventilation/air conditioning. These organize its syllabus and also are directly reflected in the requirements for ARCH 6603/6604.

For several years in ARCH 6603/6604, we have used an assessment criteria broken down into three categories—Intellectual Clarity, Craft, and Completion. This year, at the suggestion of several faculty, we added a fourth category, Construction, specifically intendent to address issues of assembly, systems, safety, regulation, and codes. This four-part rubric was applied in the Fall of 2021 for the first time. Students understand and design around the existing regulatory context for their projects.

As an example, in our Spring 2021 ARCH 6604 syllabus, we provide baseline information regarding the project's regulatory context. We then ask students to assess and apply this knowledge to their own projects, as seen below:

PROGRAM

ZONING
P (Public District)
Public district is the designation for a governmental, civic, public service, or public institution use. A P-district designation may be applied to a use located on property used or reserved for a civic or public institutional purpose or for a major public facility, regardless of ownership of the land on which the use is located.

Site Development Standards
a. For a site less than one acre, the site development regulations of an adjoining zoning district apply for a distance of 100 feet into the site. The minimum lot size requirement of an adjoining zoning district does not apply to a use by the City.
b. For a site of one acre or more, the site development regulations are established by the approval of a conditional use site plan.
See Austin City Code 25-2-624 for additional information on Site Development Standards.

For current renovation plans and timeline, see
https://www.austintexas.gov/department/barton-springs-bathhouse-rehabilitation

SITE

Buildable Site	**15,000 sf**
30% of site is open/green space	
FAR (Floor Area Ratio) = 2+	
Extended (Landscape) Site	**15,000 sf**
BUILDING PROGRAMS	**(+/- 15%)**
Base Program	
Entry/Lobby/Connector	1,000 sf
Rest Rooms (2 @ 250sf)	500 sf
Admin Offices (200 sf x 5)	1,000 sf
Storage	500 sf
Loading (w/ truck access)	500 sf
Core Programs	
Poolhouse	
Men's Locker Room	1,000 sf
Women's Locker Room	1,000 sf
Rinse Area	500 sf
Pools (x3 Hot, Warm, Cold)	4,500 sf
Multi-Use Spaces	
Small Box (1,000 sf x 2)	2,000 sf
Large Box	2,000 sf
Large Halls (x 2)	6,000 sf
Back of House	
Mechanical Room(s)	1,000 sf
Pool Equipment Room	1,000 sf
Storage and Staging	1,000 sf
SUBTOTAL	22,500 sf
Gross Factor (MEP/Circ)	+20%
RANGE OF TOTAL (+/- 15%)	**25,000-30,000 sf**
Other Requirements:	
Outdoor Performance	2,000-5,000 sf
Mechanical Yard	2,000 sf
Loading Dock and Access	

OCCUPANCY
Base Occupancy **A-3 Assembly**

Includes assembly uses intended for worship, recreation or amusement or other assembly uses not classified elsewhere in group A, including:
Art galleries, Exhibition halls, Gymnasiums, Swimming Pools, Museums

BUILDING TYPE

Type I (A or B)	**Fire-Resistant**
Type II (A or B)	**Non-combustible**
Type IV	**Heavy Timber**

(Will vary based on construction)

Our benchmarks for these four criteria include health (natural ventilation, daylighting, materials, access to open space), safety (MEP systems, egress, fire), and welfare (evident in the previous areas, and also in the selection of programs and sites having to do with issues of public concern.

The current assessment rubric in the M.Arch studio courses ARCH 6603 and 6604 is based on a several criteria, with a scale of 1-5 in each area. These elements are considered in addition to other assessment areas as a part of an overall grade. Regarding Health, Safety, and Welfare, ARCH 6603/6604 progresses from the broad scale of urban and cultural welfare, to specific questions of building mechanics, performance, and safety. We measure each student's ability to make decisions demonstrating both the understanding and representation of:

- Life safety codes (including fire codes and egress)
- ADA and Accessibility
- Evaluative process architect use to comply laws and regulations as part of the project
- Local building codes
- Zoning
- Occupancy types
- Construction types
- Lot development regulations

In each case, students compare and contrast their strategies with industry standards, in collaboration with their architect-instructors as well as with external engineers, code consultants, sustainability experts, programming consultants, and others. The

feedback from these consultants is then folded into our student evaluations and grading processes, including a rubric. The questions in the rubric below are supplemented with specific faculty evaluations of students' approaches to the elements above:

GRADING RUBRIC ARCH 660X — Scale of 1-5

CRAFT		INTELLECTUAL CLARITY		COMPLETION		CONSTRUCTION	
Is the project attentive to questions of scale, space, proportion and atmosphere?		Are the contextual elements used in the project concept clear? (i.e. are history, culture, urban and geophysical context clearly referenced?)		Is the project represented in such a way that it is fully understandable?		Is the construction assembly of the project realistic in terms of architecture industry standards?	
Are digital and physical models well made? Do they indicate space, transparency, opening, solidity, and structure clearly?		Are the parti and massing elements in the project clear? Is there an apparent logic and sequence to how these elements were developed and how they interrelate?		Are the requirements and deliverables for the studio met?		Are building systems (structure, MEP, material etc) represented correctly through drawing, diagrams, and imagery?	
Are renderings and collages clear in their construction? Do they explain the architecture in terms of space, scale, proportion, light, and material?		Do the building systems (structural, atmospheric, material) follow from the project concept?		Do the drawings and images contain everything needed to accurately convey the project?		Are references made to industry standards in terms of construction, codes, and regulations?	
Do diagrams clearly explain how the project works?		Is the project as a whole legible? Do the individual parts, drawings, and images support the larger concept?		Was the student attentive to feedback and to revisions in the design process?		Does the student demonstrate an understanding of how their building would be assembled?	
Are the drawings well-crafted according to architectural standards? Are line weights and other drawing elements clear?		Does the project reference or make use of common understandings of architectural knowledge?		Did the student engage with the instructor and other students in a productive, collaborative way?		Do building systems in the project work together?	

These evaluations are compared to similar work performed in previous semesters and years. In these comparative evaluations, we look at the quality of both integration and representation. Through numerous semesterly meetings with the studio faculty and coordinator, we evaluate the integration of parallel sections as a singular team-taught unit—as well as conversations with the Director of Graduate Studies and the Graduate Committee. The curriculum is systemically reevaluated through the feedback loop of the micro and macro expectations. We actively seek student feedback on project types, workload, learning goals, and our own instruction. We also use industry standards as a continuous set of benchmarks—provided by both our instructors and our invited guests. Lastly, we examine the general state of discourse at other architecture schools to understand the pedagogical direction of the profession as well as the criteria and benchmarks used both nationally and internationally. We engage in assessment and course correction based on both guest and student feedback every semester.

The end result each semester is a grading matrix that takes these various evaluation methods into account. Here is an example:

ARCH 660X LEVEL II GRADES

	Project 1.1 + 1.2					Project 2 Midterm							Project 2 Final							
STUDENT	Clarity	Craft	Completion	Construction	TOTAL	Clarity	Craft	Completion	Construction	TOTAL	MIDTERM TOTAL	MIDTERM GRADE	Clarity	Craft	Completion	Construction	TOTAL	PARTICIPATION, COLLABORATION, LEADERSHIP	FINAL TOTAL	GRADE
	3	3	3	2	2.75	3	1	2	2	2.00	2.38	C+	3	2	2	2	2.25	3.00	2.4	C+
	4	3	3	3	3.25	4	3	3	3	3.25	3.25	B+	4	4	4	3	3.75	4.00	3.6	A-
	4	4	4	4	4.00	4	4	5	4	4.25	4.13	A	5	3	4	4	4.00	3.00	4.0	A
	4	4	3	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	4	4	3.50	3.00	3.4	B+
	4	3	4	4	3.75	3	4	4	4	3.75	3.75	A-	5	4	4	3	4.00	4.00	3.9	A
	3	2	4		3.00	3	3	4	3	3.25	3.13	B	3	3	4	3	3.25	4.00	3.3	B+
	4	3	4	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	3	3	3.00	2.00	3.1	B
	4	3	3	3	3.25	3	3	3	3	3.00	3.13	B	3	2	3	3	2.75	2.00	2.8	B-
	2	2	1	2	1.75	2	2	1	3	2.00	1.88	C-	2	2	1	2	1.75	2.00	1.8	C-
	3	3	3	3	3.00	3	3	3	3	3.00	3.00	B	4	3	2	3	3.00	3.00	3.0	B
	4	4	3	3	3.50	4	3	3	3	3.25	3.38	B+	4	3	2	3	3.00	4.00	3.3	B+
	3	4	4	4	3.75	4	3	4	4	3.75	3.75	A-	5	3	4	3	3.75	3.00	3.7	A-
	4	4	4	3	3.75	3	4	4	4	3.75	3.75	A-	4	5	4	5	4.50	3.00	4.0	A

Using our assessment tool, we set benchmarks for Fall 2021 to be that that 90% of the class (of all ARCH 6603 students) would receive at least a 70% at midterm review and 90% would receive at least an 80% at final review. The goal is to encourage improvement over the course of the semester, both in our teaching and in student performance

ARCH 3230/6360 Professional Practice

In our professional practice courses, our goal is to extend student knowledge and understanding of regulatory context. In addition to presenting issues of life safety, land use, zoning, occupancy, and other code related aspects of architecture, these courses also encompass legal aspects of architectural practice and the regulatory environment, including:

- Legal context of the project
- Land use
- Law and regulation on the design practice
- Law and regulation on the build environment
- Law and regulations of building design in the United States

3. EVIDENCE

UHCoAD provides a number of elements to the NAAB visiting team as evidence. The most comprehensive evidence we provide is complete student projects and designs. Our goal is always to ensure that the complexities of the regulatory context are presented clearly and completely. We also provide complete lectures and presentations by both UHCoAD instructors and guests. All course materials, including syllabi, handouts, and our required course reader, are also available to the visiting team.

4. FUTURE DEVELOPMENTS AND BENCHMARKS

As with all our courses and programs, we strive to expand our teaching of regulatory context. In the future, we would like to run studios that use regulatory and land use questions as a jumping-off point. We appreciate insights from other programs as well as alternate approaches. Our faculty frequently visit other schools and studios to understand how diverse pedagogical methods work in the context of Building Integration. Locally, we have been in conversation with both Rice University and Texas A&M University regarding their own efforts.

We are working to update and strengthen our approaches to regulation, codes, and life safety—both from the perspective of assessment and design. Our instructors are always evaluating new tools and making use of existing and new resources within the College: the new Advanced Fabrication Lab, the Materials Resource Center, the Keeland Center for Fabrication, and our own Computer Lab.

Moving forward, we would also like to better integrate our Tech and Studio offerings. Though they currently work closely together, they can ideally be refashioned as a seamlessly integrated set of parallel approaches, resonating off one another. We plan to add specific items to our rubrics that address regulatory context, especially in our Building Integration Studios (4510 and 6604). In the Graduate Program, the "Construction" assessment criteria will be expanded in future semesters to deal more comprehensively with codes and regulation, and we will invite local professionals with an understanding of best practices to help our faculty to evaluate student work in these areas.

In 4501, the rubric offered helpful feedback to the faculty and students but proved difficult for guest reviewers to complete while also interactively reviewing the projects and participating in a discussion with the students. In addition, we have found it difficult for the faculty to consistently retrieve the assessments after completion due to the voluntary role of these reviewers.

We have learned that the assessment process needs to be separated from the interactive design review process so that the assessment may receive the focus that it deserves. We plan to hire a team of outside experts to conduct the assessment so that the team members will be accountable for completing the assessment task. In the undergraduate program for Fall 2022, the assessment rubric will be revised from a 5-point scale to a 10-point scale so that it aligns with assessment tools developed for the 2501, 3500 and 3501 studios. This will create greater consistency with the use of the assessment tools throughout the undergraduate program and foster greater familiarity within the student body and faculty team.

Lastly, we are strengthening our connections to the local Houston community. We currently have close ties to the community and many of its architect-members participate in design reviews and presentations. Nevertheless, we could have stronger connections with the planning department of the City Houston, the Public Works Department, and local planners and developers. We would also like a more robust approach to client relations, field work, and examination of both built works and works under construction.

3.2 SC 4 – Technical Knowledge

SUBMITTED APR TEXT

SC.4 Technical Knowledge—How the program ensures that students understand the established and emerging systems, technologies, and assemblies of building construction, and the methods and criteria architects use to assess those technologies against the design, economics, and performance objectives of projects.

Program Response:

BARCH

ARCH 2327 – Technology 1
ARCH 2328 – Technology 2
ARCH 2500 – Architecture Design Studio III
ARCH 2501 – Architecture Design Studio IV
ARCH 3327 – Technology 3
ARCH 3328 – Technology 4
ARCH 3500 – Architecture Design Studio V
ARCH 3501 – Architecture Design Studio VI
ARCH 4327 – Technology 5
ARCH 4510 – Architecture Design Studio VII

MARCH

ARCH 6A48 – Environmental Tech III
ARCH 6A50 – Construction Technology III
ARCH 6603 – Design Studio III
ARCH 6A49 – Environmental Tech IV
ARCH 6A51 – Construction Technology IV
ARCH 6604 – Design Studio IV
ARCH 6361 – Integrated Practice

Approach

The technology curriculum in both the Graduate and Undergraduate programs at the Gerald D. Hines College of Architecture and Design is invested in architectural design both in informing the practice of architecture and in applying the skills and information-based attributes underlying both programs. As such, technical knowledge of structures, environmental systems, materials, assemblies, and building construction are essential across the curriculum. Students are guided through the complexity of buildings as systems and their applications in real life scenarios. Technical knowledge can be understood through three interconnected and at times overlapping silos: 1) issues and principles; 2) tools and techniques; 3) applications and case studies. Our program constantly seeks to cover these pillars in an organic and by no means segregated way. Knowing the fundamental issues and principles of building technology serves as the foundation to analyze and critically study precedents and recent case studies, while state-of-the-art methods and tools assist with analytic and creative activities relative to design.

Understanding and defining knowledge in the technological knowledge component of the curriculum is multi-tiered, starting with an emphasis on understanding the role of performance-related information in support of conceptual ideation. This plays a vital role in underpinning a great deal of the technology curriculum at the Gerald D. Hines College of Architecture and Design. Five courses in both Undergraduate and Graduate programs are comprised of these performance-related criteria. Each course has distinct evaluative criteria, ranging from documenting the understanding of key structural and environmental system considerations via analytical assignments and tests, to providing drawn documentation of the assembled and performance-based nature of building envelopes through wall sections, assembly drawings, and in dossier submissions.

Undergraduate Program

There are five technology courses in the undergraduate program: ARCH 2327 – Technology 1, ARCH 2328 – Technology 2, ARCH 3327 – Technology 3, ARCH 3328 – Technology 4, and ARCH 4327 – Technology 5, that focus on core structural, environmental systems and building envelope / material / assembly considerations**.**

ARCH 2327 – Technology 1.- Initial introductory course content seeks to integrate and instill an understanding of information and performance-based facets, including issues such as sustainability, building systems, and material considerations in both structural and building envelope applications, linking this information with idea-based themes underlying studio investigations. Our intent is to provide students with a balanced and inclusive perspective of the need for an integrative understanding of both domains.

Following the introduction of broad technological and performance-based subject matter, the prime objective of subsequent course content of ARCH 2328 – Technology 2 pursues practices intended to deepen the comprehension and application of these factors, developing an understanding oftheir impact on building design. This is achieved through a process of repeating fundamental aspects of primary course content and introducing new subject matter as students matriculate through the technology sequence. The process is further enhanced using both academic and professional faculty. Academic faculty provide the students access and understanding to the broad and integrative nature of performance-based architectural positions while professional engineers provide more focused and in-depth application to structural and mechanical considerations.

An attribute of the technology sequence that continues to gain additional integration links studio design issues with performance-related considerations. The lab component of the five technology classes increasingly incorporates the use of studio projects as conduits for exploring principles underlying the technology curriculum. Student perception of performance factors as a development of design themes is provided in laboratory assignments. These assignments help students understand outcomes and solutions through incorporating them into their design approaches. The overarching goal is to mend the split that often occurs between these two principal components of architectural curriculums.

In the undergraduate program the introductory course, ARCH 2327 – Technology 1, focuses on introducing students to the broad range of performance-based topics necessary to an integrative design process. These include human factors, material understandings in both structural and architectural applications, and sustainability and building envelope considerations. Primary assessment criteria for this course, beyond mid-term and final exams, includes drawing wall sections of building precedents assigned in the design studio followed by a more informed wall section documenting the design of the studio project. The initial wall section documentation occurs before mid-semester, with the latter occurring towards the end of the semester. Both sections are drawn at ¾”=1’-0” and are paired with an elevation, also drawn at ¾”=1’-0”.

For the past six years, ARCH 2327 – Technology 1 has been followed by the ARCH 3327- Technology 2, and ARCH 3327 – Technology 3 courses in which a format that combines structural and environmental system integration into the design process is incorporated into the curricular content of both courses. Beyond fundamental structural and environmental system design applications, a primary goal underlying this format is to provide students with insights as to the integrative nature of the design process as both semesters focus on structural and building systems applications. From this exposure students gain not only the requisite technical and performance-related criteria, but they also further understand the multiple voices constituting the entirety of the design team. While evolving, and to be discussed below, the primary evaluative tools of both the ARCH 3327- Technology 2, and ARCH 3327 – Technology 3 courses have multiple calculation and performance-based submissions along with mid-term and final exams.

The ARCH 3328 – Technology 4 course, which utilizes a case study format for much of the lecture content, returns to a more architecturally based curriculum featuring further discussion of integrated building systems with an added emphasis on perspectives relating to sustainable solutions. These systems include site and climatic responses, program application, structural and environmental considerations, envelope assemblies, and materiality. The labs integrate with the 3501 studio projects and build upon the studio- project-focused relationship occurring in ARCH 2327 – Technology 1. Pinups occurring during the labs focus on research and application with the research documenting how various system precedents address issues being presented and discussed in the lectures. The application feature of the pinups document similar issues and their relationship to the requirements of the studio project. The pinups and a required dossier submission at the midpoint and end of the semester represent the prime evaluative tools incorporated into the ARCH 3328 – Technology 4 class.

Additional activities occurring in the ARCH 3328 – Technology 4 class that address collaboration include visits to construction sites. These are planned and organized by students who visit in teams of four to five. Construction sites are visited every other week over a 12 to 14-week period to observe various construction activities over an extended period. Recently, virtual reality and

augmented reality software applications have been added to the lab component of the course to provide a form of "design-build" integration. This is achieved through modeling virtual assemblies and employing an "exploded" format to create and document—and make students visually aware of in three dimensions—the multiple parts comprising building envelopes.

ARCH 4327 – Technology 5 also utilizes a case study format and incorporates numerous guest lecturers from allied disciplines. The curricular focus is on materials and methods and continues an evaluative format that requires dossier submissions, including an analysis of how design and delivery methodologies are measured. In addition, understanding the role of professional practice is addressed in relation to exposing the students to specifications and contractor relationships. Beginning in Fall 2020, changes to ARCH 4327 – Technology 5 are making inroads further linking the class to the ARCH 4510 Integrated Architectural Solutions studio.

Assessment, Benchmarks, Modifications, and Innovation,

Assessment Process. -
Over the academic years of 19/20, 20/21 and 21/22 the B.Arch Program has changed its assessment routines to the ones established before. Grad and Undergrad have collaborated and discuss the best mechanism to do a consistent assessment format for both programs. The new assessment method of UGA has introduced two structural changes:

- 1/ Incorporation of the roll of the external reviewers.
- 2/ Review of complete contents of strategic studio courses by establishing a series of rubrics per course.

In each course, the rubrics containing the following questions (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 (EXPECTED) or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

Initial evaluation points relative to coursework assignments will include:

- -understanding of established systems,
- -understanding of emerging systems,
- -understanding of technologies of the built environment,
- -understanding of technologies of building construction,
- -understanding of technologies of assemblies of building construction,
- -understanding of assemblies of building construction,
- -understanding of methods and criteria that architects use to assess those technologies against design, economies and performance objectives of projects,
- -understanding of building structural systems,
- -understanding of building environmental systems,
- -understanding of building construction systems,
- -understanding of building materials,
- -understanding of material technologies,
- -understanding of material ecologies,
- -understanding of matter versus material,
- -understanding of the relationship of technology and labor
- -understanding of the relationships of technology and geography,
- -understanding of the materiality and geography,
- -understanding of the cultural context against the technological context,
- -understanding of building performance,

- -understanding of sustainability and building envelope considerations,
- -understanding of the role of technology on design
- -understanding of the technical documentation
- -understanding of the technical representation.

The program assesses the technological knowledge learning outcomes through studio courses at the Intermediate Level and comprehensive level as the technical knowledge is inherent to the design process of the three Architecture Design Studio courses of ARCH 3500, ARCH 3501 and ARCH 4510, and the technology curriculum coordinates ARCH 3327-Technology 3, ARCH 3328-Technology 4, and ARCH 4327-Technology 5 contents with previous studio listed respectively.

Design Studio course ARCH 4510, Integrated Architectural Solutions, is the benchmark for the program's assessment of Technical Knowledge. ARCH 3500- Architecture Design Studio V, and ARCH 3501- Architecture Design Studio VI are contributing courses for the assessment of technical knowledge.

Assessments of Technical Knowledge of the three studio courses of ARCH 3500, ARCH 3501 and ARCH 4510 are performed at the Midterm Reviews, the Final Reviews and at the Assessment's Sessions. This process has been developed over the past two and a half Academic Years. Rubrics has been discussed and progressively implemented in the course schedules. However, assessment has not been not fully completed as described above and below for each semester at this moment. Midterm Reviews' assessments are conducted internally to anticipate and discuss results in preparation of Final Reviews. Midterm and Final Reviews are organized as follows:

- The Midterm Reviews are assessed by internal reviewers. Reviewers are organized as follows: For the Midterm Review, each course section organize a board of reviewers. The reviewer's board is formed by 3 members: 2 internal faculty, one from another section of the same course, another from a different studio-level or academic area, and 1 upper-level student. Rubrics are filled and returned to the faculty for feedback, assessment and data collection.
- Final Reviews are assessed by external reviewers. A reduced number of sections of each design studio course level (ARCH 3500, ARCH 3501 and ARCH 4510) are selected randomly to be reviewed by external reviewers. The external reviewers are expected to return one fulfilled rubric per student/per section. Data is collected and analyzed.
- Assessment Sessions: At the end of each semester starting with the Fall of 2020, all studio faculty meet with the course faculty and present to the whole group one high pass, one average and one low pass in addition to the course premise. After presentations, a discussion helps the group to make considerations before finalizing grades. The session permits each faculty of having the overview of all similar sections and upper and lower levels before grading. Assessment sessions are also coordinated in the technology academic area. Meetings have been recorded and share with faculty for consultation since Fall of 2020.

Assessment of Technological Knowledge in Design Studio courses ARCH 3500, ARCH 3501 and ARCH 4510

The B.Arch program has prepared a series of rubrics implemented progressively from ARCH 3500, ARCH 3501 and ARCH 4510 Architecture Design Studios for the assessment of the student understanding of the stablished and emerging systems, technologies, and assemblies of building construction, and the methods and criteria architects use to assess those technologies against the design, economics, and performance objectives of projects. From contributing to program assessments, the sequence is described as follows:

ARCH 3500- Architecture Design Studio V- *Initial demonstration of how the student work develops, selects, configures, proportion, deploys and integrates established or emerging systems and how the project shows initial resolution of assemblies of building construction in response to user/project needs and program requirements. (See rubric's item bellow)* Technological Knowledge rubric's item at ARCH 3500 is to be rated as- Unacceptable, Faulting, Developing, Expected or Exemplary.

We expect that 80% of our students will earn an average rating of “Expected” or better on the Technological Knowledge element on the ARCH 3500 Project. The collected data is introduced in an excel file for analysis and conclusions.

APA F22 ASSESSMENT RUBRIC FOR INTERMEDIATE STUDIO PROJECTS at ARCH 3500 IN THE UHCoAD UNDERGRADUATE PROGRAM

NAAB Criteria for ARCH 3500- PC.2, PC.3, PC.5, PC7, SC.4, SC.5, SC.6

ARCH 3500	Fundamental flaws in the basic selection and configuration of building systems. Inappropriate methods of systems integration; basic errors or incomplete work in the employment of fundamental systems.	Incomplete integration of technical systems with major commissions. Major conceptual errors in the selection and configuration of building systems. Failure to address sustainable principles of ecological design	Some minor errors and missed opportunities in the integration of technical systems. Some slight misalignment of design intention and system implementation including hardware and material selections	Competent integration of technical constraints, accurate implementation of technical systems, appropriate selection of technology, attention to passive and active systems, responds to sustainable principles	Surpasses the better standards of technical criteria and integrates all technical systems to a high level. Exploits the characteristics of all systems. Embraces net zero energy and/or carbon neutral design.
	UNNACEPTABLE (1-2)	FAULTING (3-4)	DEVELOPING (5-6)	EXPECTED (7-8)	EXEMPLARY (9-10)
RESEARCH/INNOVATION site conditions, infrastructures, social and cultural context, program, and material opportunities to define the design problem.					
SITE ANALYSIS Site Analysis and relationships between matters such as: Topography, water shed, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.					
APPROPRIATENESS- Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs and demostrate adaptation, and resilience principles in the designed work and advocacy activities					
DESIGN SYNTHESIS, OBJECTIVES AND STRATEGIES research input / research impact into design solution. Ability to make design descisions while demonstrating synthesis of user requirements, regulatory context, site conditions, and accessible design. Demostrates the values of the design objectives and strategies.					
CREATIVITY- Merges innovation and appropriateness; bridges the real and the ideal; balancing risk and certainty					
TECHNOLOGY- Development, select, configure, proportion, deploy and integrate of stablished or emerging systems. The project shows initial resolution of assemblies of building construction in response to user/project needs and program requirements					

ARCH 3501- Architecture Design Studio VI-.- Demonstration of how the student work develops, selects, configures, proportion, deploys and integrate established or emerging system. The project shows resolution of assemblies of building construction in response to user/project needs and program requirements, and considerations on the measurable environmental impacts. (See rubric’s item bellow)

Technological Knowledge rubric’s item at ARCH 3501 is to be rated as- Unacceptable, Faulting, Developing, Expected or Exemplary.
We expect that 80% of our students will earn an average rating of “Expected” or better on the Technological Knowledge element on the ARCH 3501 Project. The collected data is introduced in an excel file for analysis and conclusions.

APA Sp22 ASSESSMENT RUBRIC FOR INTERMEDIATE STUDIO PROJECTS at ARCH 3501 IN THE UHCoAD UNDERGRADUATE PROGRAM

NAAB Criterial for ARCH 3500- PC.2, PC.3, PC.5, PC7, SC.3, SC4, SC.5, SC.6

ARCH 3501	UNACCEPTABLE (1-2)	FAULTING (3-4)	DEVELOPING (5-6)	EXPECTED (7-8)	EXEMPLARY (9-10)
RESEARCH/INNOVATION Research of site conditions, infrastructures, social and cultural context, program, and new material technologies to define the design problem. Innovative response.					
SITE ANALYSIS Site analysis and relationships between site elements such as: Topography, water shed, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.					
APPROPRIATENESS- Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs, reflects ecological knowledge and responsability towards climate change mitigation by leveraging ecological, advanced building performance, adaptation and resilience principles in the designed work and advocacy activities					
DESIGN SYNTHESYS CONSIDERED AT MULTIPLE SCALES. research Input / research impact into design solution considering multiple scales. Ability to make design descisions while demonstrating synthesis of user requirements, regulatory context, site conditions, and accessible design.					
REGULATORY CONTEXT - Clearly achieved and represented: Life safety, land use, laws and regulations.					
TECHNOLOGY/MATERIALIATY/CONSTRUCTABILITY- Development, select, configure, proportion, deploy and integrate of stablished or emerging systems. The project shows resolution of assemblies of building construction in response to user/project needs and program requirements and considerations on the measurable environmental impacts.					
CREATIVITY-Merges innovation and appropriateness; bridges the real and the ideal; balancing risk and certainty					
INTEGRATION- Partial demonstration of integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems, and the measurable outcomes of building performance.					

ARCH 4510.- *Demonstration of how the student work develops, selects, configures, proportion, deploys and integrate stablished or emerging system. The project clearly resolution of assemblies of building construction in response to user/project needs and program requirements, and considerations on the measurable environmental impacts. (See rubric's item bellow)*

Technological Knowledge rubric's item at ARCH 4510 item is to be rated as- Unacceptable, Faulting, Developing, Expected, Exemplary.

We expect that 80% of our students will earn an average rating of "Expected" or better on the Technological Knowledge element on the ARCH 4510 Project. The collected data is introduced in an excel file for analysis and conclusions.

Checklist for ARCH4510 Final Juries – Fall 2021

TEAM _____

		not met		adequate		exceptional
(please score lowest to highest)		1	2	3	4	5
1/	Solar Orientation/Sustain notes	1	2	3	4	5
2/	Site Plan Accessibility notes	1	2	3	4	5
3/	Life Safety Plan notes	1	2	3	4	5
4/	Structure Integration notes	1	2	3	4	5
5/	Envelope Design notes	1	2	3	4	5
6/	MEP Integration notes	1	2	3	4	5
7/	Materials Selection Notes	1	2	3	4	5
		__	__	__	__	__ SUBTOTAL __
Other Notes:						
	Design Synthesis/Response notes	1	2	3	4	5
	Graphic Representation notes	1	2	3	4	5
	Technical Understanding Notes	1	2	3	4	5
		__	__	__	__	__ TOTAL __

The technology curricular academic area is particularly relevant for the achievement of the Technological Knowledge element. The assessment conducted over the two academic years of 2019/2020 and 2020/2021 for the Academic Program Assessment Report for the Institution has demonstrated the technical proficiency of most of the students has not met the expectation of the 90% of the students earning an average rating of "Acceptable" or better. This assessment result has led to making a curricular content change to be in place in the academic year 2022/2023 on the technological sequence and focus on one only topic of technology per semester, resulting in that ARCH 2501 will be coordinated with ARCH 2328 - Structural Systems, ARCH 3500 will be coordinated with ARCH 3327 -Assemblies and Joinery, ARCH 3501 will be coordinated with ARCH 3328 - Environmental Systems and ARCH 4510 will continue to be coordinated with ARCH 4327 - Integration topic to emphasize the aspect of constructability of the designed work including solutions for the building systems Integration, constructability and performance.

Assessments occurring during the last five years have led us to create a more balanced, “architecturally-centric” approach. This includes the creation of co-coordinator roles— both coordinators are faculty who are registered architects. This led to the implementation of the semester dossier requirements in ARCH 3328 – Technology 4 and ARCH 4327 – Technology 5, enhanced integration with studio projects, and the virtual reality and augmented reality assembly components mentioned above. In addition, further integration with studio projects is now occurring in the Tech 2 and 3 courses with required framing and mechanical system layouts documented in 2D plan overlays and 3D models.

Ongoing assessments and adjustments to the technology curriculum have been established. Building on the recent incorporation of studio projects into the requirements of the technology labs, new planned adjustments to the technology curriculum include expanding the labs from two hours to three hours and instilling the principle that the laboratories are the “leader” of the various technology classes. Their integration with studio-like thinking will be heightened through further assimilation—via precedents and additional integration with studio projects—of the exploration of relevant technology performance-based themes. Ongoing modifications we are considering include: 1)adding a new course strictly focused on materials and assemblies; 2) exploring additional content adjustments to facilitate further integration of components of the Technology curriculum to meet the needs of the Interior Architecture program.

Benchmarks that run through the technology curriculum relate to confirming student understanding of core technology-based considerations with an additional focus on the building’s envelope and the multiple functions required of it. Broad technology-based attributes are evaluated and benchmarked in Tech 1, 2, and 3 through standard mid-term and final exams. Grades on these exams represent the primary benchmark tool in which the average of each semester’s exams provide documentation of the efficacy of both teaching and retention. Additional evaluative tools are provided through assignments that integrate with the studio projects. These document the application and understanding of content relating to technological and studio themes providing diverse evaluative tools to mark progress in both content and application realms. An additional benchmark relating to issues affecting the design of the building’s envelope occurs in ARCH 2327 – Technology 1, ARCH 3328 – Technology 4 , and ARCH 4327 – Technology 5 through wall section and assembly drawings. These exercises provide evidence of a progressive maturation beginning with preliminary explorations undertaken in Tech 1 and progress to fully developed, near professional-level documentation of a building’s envelope through a combined requirement for the Tech 5 / 4510 integrated design studios.

As mentioned in item SC.2 other lines of collaboration are in development between Studio and Technology to develop the future Tech-Studios pedagogy, that as design field, inversely will be led from the technology academic area. All technology courses from Technology 1 to Technology 4 have been reviewed to be topic-focused and implemented in the upcoming academic year 2022/2023. Under this new pedagogical mode: ARCH 2327 Technology 1 is focused on the introduction of technology, covering a broad range of architecture technology topics, ARCH 2328 Technology 2 is focused on structural systems and coordinated with studio ARCH 2501 Design Studio IV with combined requirements, ARCH 3327 Technology 3 is focused on materials, assemblies, and constructability and coordinated with ARCH 3500 Design Studio V with combined requirements, and ARCH 3328 Technology 4 is focused on Environmental Systems and Coordinated with ARCH 3501 Design Studio VI with combined requirements.

Evidence

Evidence provided to the team demonstrating how the attributes comprising the core technology-based curricula in Tech 1, 2, and 3 learning objectives are achieved are documented through the syllabi, class schedules / required submissions, and mid-term and final exams required in those courses. Documentation of the outcomes of the various building envelope assemblies that are a part of the Tech 1, 4, and 5 courses are also provided via graded evaluations of the wall section and assembly drawing submissions mentioned above.

Developments (Recent, Future)

Modifications of the curriculum content that comprise the technology component of our curriculum is ongoing. Modifications of the Undergraduate Technology curriculum occurring since the 2014 accreditation are numerous and significant. Responding to past accreditation reports for a more calculation-based and "engineered" approach, the technology courses have leveraged the College's location within the fourth-largest city in the country to incorporate a large pool of engineers from multiple disciplines. This not only provided students with the required awareness and understanding of these aspects of design, it also broadens perspectives regarding design issues of great importance to their respective disciplines. Assessments of this approach through both formal meetings and informal conversations with students revealed that the technology curriculum became "over-engineered" with student comments suggesting that they felt they were in an engineering major and not an architectural one.

An analysis of these comments, formally through course evaluations, and informally through conversations with students who had matriculated through the technology curriculum produced a two-coordinator approach with one coordinator primarily focusing on providing more architecturally centered content and the other focusing on providing greater linkages between the studios and the technology courses with which they simultaneously occur. This has led to the technology curriculum being both more focused on architectural considerations and more directly linked to studio projects. This format provides students with research and applied outcomes that relate the performance-based metrics of the technology curriculum to the architectural development of their studio projects.

Curricular modifications continue with more recent assessments based initially upon meetings between the Undergraduate Director and the Co-coordinators and subsequent conversations and analysis with the larger technology faculty. This assessment provided for three significant changes to the technology curriculum in the Undergraduate Program. An initial modification is beginning in the Spring semester of 2022. The two course format with combined structural and environmental systems content (Tech 2 and 3) are being restructured into a format where one course, Tech 2, provides a structural focus and a second course, Tech 4 provides an environmental focus beginning in the Fall of 2022.

Other additional changes are being phased in as a part of the in-house assessment process. New course content will be offered in a reimagined Tech 3 course with a focus on materiality, assembly and the building's envelope. This course will also commence in the Fall 2022 semester. To facilitate assembly and building envelope considerations the course will also incorporate the use of virtual reality platforms initially incorporated into the Tech 4 curriculum but were required to be removed due to pandemic related concerns surrounding the use of headsets.

The third change in the technology curriculum relates to establishing the lab component of the technology courses as the "lead" component of the curriculum. This will be facilitated in two ways. The first, and most important from a student learning standpoint, is to enhance the curricular integration format already underway through increasing the use of studio projects as vehicles for studying and evaluating performance-based design determinants that are the core of the technology curriculum. To provide for a more studio-like learning environment the duration of the technology labs will be increased from a two-hour format to a three hour one and will occur in the studios with both faculty and instructional assistants available to provide input.

Graduate Program

In the first semester, Level I students engage in the process of developing concepts and establishing goals. Students are introduced to the cultural, spatial, geopolitical, and material contextualization of design. Parallel to the studio, structural and environmental technology classes introduce students to fundamental building concepts that relate to the profession at large. Through historical examples and building physics fundamentals, students at the CoAD are challenged with modern technological and computational advances—this allows them, from the beginning of their studies, to position themselves in the contemporary discourses of the profession.

This process continues into the second semester of the M.Arch. Level I, as students engage in the early design phase of our Graduate Design-Build Studio (GDBS), which is typically fabricated and installed over the following summer. Although technology classes maintain their curricular independence from studios, continuous faculty coordination, cross-reference of materials, and faculty cross-attendance at student presentations enable a preliminary integration plan. The GDBS 2021 started with experimenting with a building system using wood, which progressed to the design of a single-family house during the second half of the semester. The students were able to demonstrate competent designs and support their arguments with the use of theoretical/conceptual as well as practical methods and tools—for example, using THERM software for detailing and thermal

bridging assessment.

The Level II fall semester studio project advances scale and complexity. Structural and Environmental Technology classes move from introductory concepts to in-depth knowledge of architectural, structural, and mechanical systems. The students get into the process of possessing the tools to support their design decisions through programming, tectonic and ecological strategies, site, space, and social engagement. The parallel mandatory technology classes take place mainly in a lecture-based environment that prioritizes theoretical background. Classes remain interactive and dynamic, however, engaging student participation and hands-on manual and computational applications.

Closing the sequence of a complex and dynamic process of understanding design at all levels, the Level II spring Building Integration Studio requires the design of a complete and well-developed building. Clear architectural and technical solutions are emerging from conceptual ideas, social and cultural aims, through the integration of complex technical elements including structure, envelope, plumbing, mechanical, and electrical systems. Architecture is seen as both abstract and specific at once, integrating high levels of technical information while also plugging into diverse cultures and contexts. Again, continuous faculty coordination of schedules and synchronization of topics, integral cross-reference of materials, and faculty cross-attendance of student presentations, enable a coherent integration plan where students assess their designs against regulatory, economic and performance objectives discussed in technology classes.

Environmental and Structural Technology classes use several benchmarks to assess students' competence. Short technical recorded videos are disseminated to give way to active discussions during class. Live lectures are complemented with real life case studies, short quizzes, and short computational applications, where theory converts to practical representations of the built and simulated world. Invited lecturers from industry and academia reinforce a diversity of voices, contributing to the understanding of design as a multidisciplinary, collaborative effort. During fall semesters, the main assessment methods are class attendance and participation, periodic (usually bi-weekly) assignments that demonstrate analytic skills, composition of a final dossier with revised assignments that demonstrates the impact of constructive feedback, and test exams that validate theoretical knowledge. Spring semesters are primarily lab-based with class-long computational workshops and student presentations of case studies (e.g., built COTE Top Ten awarded projects). These semesters have a project-like structure in parallel with the studio. Assessment criteria include class attendance and participation, periodic (usually bi-weekly) assignments, research paper authorship (Level I), student case study presentations, "simulation game," and studio integration presentations (Level II).

Instructors for the technology sequence are experts in the taught subject; their work lies between application and research. As a result, their directional input constitutes both the trends in the professional world as well as the state-of-the-art methodologies experimentally introduced through recent research.

Assessment, Benchmarks, Modifications, and Innovation

Assessment and adjustments occur on an ongoing basis for all technology sequence classes. These are driven by multiple formal or informal processes, with the most important ones being student feedback and the understanding of trends within the profession. Student feedback acts as the best way of evaluating the teaching mode's effectiveness, the teaching methods and tools, and the achieved level of integration with design studio. State-of-the-art technological advancements as well as active environmental and structural considerations at the AEC community act as the primary content drivers, which is gradually adjusted to meet those developments.

Some of the recent changes in delivering the content were driven by the demands of the current pandemic and the need to include more interactive techniques. There has been an underlying need to actively engage students and more effectively mix theory with practice. This was achieved with more interactive classes, which often make the students co-creators of the content. Students participate actively through presentations and quizzes, there is more time allocated to questions and open conversations, and students can choose their area of focus and take leadership on the course of their projects. These changes have delivered positive results thus far. The program will continue investing in their implementation beyond the restrictions of the pandemic.

In parallel, technology sequence classes strive to follow the most recent advances that have become central in architectural discourse. During massive computational and technological advancements in the field of design, as we face the most pressing

climatic crisis as a species, and as the conversations around equity and inclusion grow, this program is reacting to these dialogues by incorporating content and practical representations in the curricula. Those can take the face of diverse invited lecturers at a local and national level, or state-of-the-art resources and information that derive from the latest events and research initiatives. Students are able to identify themselves as active members of the community that are ready to actively contribute to these discourses.

ADDITIONAL GRAD COMMENTS (MK)

Technology courses have undergone several substantial changes over the past two years, starting with an instructor replacement for Environmental Technology sequence and approach restructure of Construction Technology sequence. We acknowledge that the previous structure of the courses constitutes a very good basis and that remains the foundation of content sequencing. The development of the courses is then focused on updating delivery methods and tools and augmenting connection to industry.

Student feedback to the taught program's structure, content, delivery and teaching methods is sought throughout the year. Such feedback is important in helping to plan forthcoming events of following terms, as well as for improvement and updating of the contents of the program from year to year. At the end of the year a questionnaire form is distributed for written feedback by outgoing student groups.

Assessment of individual and team work for the M.Arch Technology sequence is based on the following criteria:

1. Evidence of a clear methodology in the investigation of research questions and hypotheses
2. Demonstration of understanding of the principles introduced by the taught program
3. Demonstration of critical faculties and observational skills
4. Use of observations and analytic tools in testing research hypotheses and finding new data
5. Ability for comparative analysis and meaningful generalization
6. Responsible application of technical knowledge and analytic tools
7. Ability to apply new knowledge and tools in design research and practice
8. Demonstration of innovative thinking and creativity
9. Clear structure, writing and presentation of project results
10. Referencing of sources of information using agreed conventions
11. Adherence to project briefs and other preset requirements
12. Indication of individual contributions in the case of teamwork.

The assessment rubric for the Technology series encompasses five main criteria that are evaluated from 0 to 5 based on table 1. The rubric is used on assignments, research papers, and oral presentations.

Table 1

SCORING RUBRIC FOR ALL ASSIGNMENTS						
ARCH UHCoA	Some representative example characteristics for each standard. Compare your work and scores to these standards					
Criterion	**0-Unnacceptable**	**1-Faulting**	**2-Developing**	**3-Expected**	**4-Better**	**5-Superior**
CRITICAL THINKING- includes analysis, synthesis, and evaluation. Shows depth of insight into research issues and their relevance.	Does not address the assigned work or the thinking essential to its completion, adopts thinking that is obvious, engages in bias or strictly personal beliefs	Shallow thinking, major flaws in reasoning, poor engagement of concepts, some unsupported statements, summarizes rather than analyzes or synthesizes	Some minor flaws in reasoning or extrapolation, logical fallacies and poor reasoning undermine the outcome, dismisses alternative views	Demonstrates clear thinking and application of concepts and principles, includes broad range of evidence, discerns facts from opinions, recognizes contextual factors	Uses insightful thinking in application of research concepts and issues of application, exceeds expectations by thinking beyond requirements of assignment	Clearly identifies the challenges of the work, recognizes subsidiary, embedded, or implicit aspects of related issues and complexities inherent in the assignment
DEVELOPMENT- ideas, thoughts and details are well-developed… demonstrates reflection, novel thinking, and grasp of concepts relevant to this work	Misapplication of key concepts, rote thinking and effort… major confusion is evident… generalizations made without support, cites irrelevant evidence	Low level of metacognitive thinking and reflection, lack of creative development, little cohesion between the separate parts of the work	Overstates or understates issues without adequate reasoning, over-reliance on assumptions, poor use of citations or principles, methodologically weak, ignores precedent work	Development of major points are clear, novel, and sound… a fundamental grasp of key concepts is demonstrated, uses citations and precedents	Convincing work that engages the reader, invokes ideas from published literature and seminal precedents, makes connections and relations	Takes risks beyond ordinary expectation of assignment and opens up new avenues of exploration
RESOURCES- uses tools and methods of inquiry to full advantage… shows effort and persistence as well as creativity and unique results	Fails to adequately draw on the many modes of architectural thinking and literature relevant to the work	Uses resources without adequately evaluating their appropriateness, weak use of sources and citations, ignores precedent	Restricted use of a narrow range of tools, some tools or methods maybe misused or weakly employed	Identifies and utilizes a wide range of resources appropriate to the work, methodologically sound, exemplifies creative effort, produces novel outcomes	Employs thinking across multiple disciplines or modes of thought, advanced application of tools and methods	Unique and novel work based on creative use of sources and citations, methodologically strong, demonstrates extensive and in-depth use of tools
COMPLETENESS- Length is appropriate to content, goals of assignment are addressed, format complies to requirements	Work is substantially incomplete, or does not meet many key criteria of assignment	Effort is poorly focused or misdirected, misses some aspects of the intended purpose of the task as assigned	Addresses purpose of the work, but may fail to respond to minor aspects of the assignment	Responds to all the criteria and goals of the assignment, establishes significance or purpose of the task in larger context	Exceeds the criteria and goals of the assignment, takes risks and thinks creatively	Synthesizes evidence, integrates sources, articulates views and perspectives at a high level
MECHANICS- Well written, clear organization, uses standard English grammar, contains minor, if any, spelling errors	Does not meet college level writing standards or TOEFL requirements for English writing, lacks fluency, fails to communicate graphically	Inadequate organization, frequent errors, repetition, makes empty statements, excessive common knowledge, weak graphics and craft	Clear and logical but some problems with legibility, grammar, or spelling… some minor problems with flow and fluency	Well organized, very few errors in written or graphic vocabulary, grammar, spelling, or syntax… clearly legible	Voice, tone, format, and formality are consistent and well suited to purpose… awareness of needs and expectations of the critic	Exemplary work worthy of publication, creative and innovative craft, broad command of vocabulary and language

An example of how the rubric is used and how grades are being generated is presented in Table 2 after removing students' names. The expectation and goal for every M.Arch student to succeed is

- Eliminate letter grades C
- Achieve exam grades averaged to 8.5/10
- Achieve class average B+ and above

Table 2

A1						A2						A3						A4						A ALL	Dossier	Participation	Exam	Exam curved	TOTAL	LETTER GRADE
C1	C2	C3	C4	C5		C1	C2	C3	C4	C5		C1	C2	C3	C4	C5		C1	C2	C3	C4	C5								
9.5	9.5	9	9	10	9.4	9.5	9	10	10	9.5	9.6	10	9.5	9	10	10	9.7	9	8.5	9	10	10	9.3	9.5	10	10	8.2	8.5	9.25	A-
9	9	9.2	9.8	8.5	9.1	8	9.5	10	9.5	8	9	9	9	9	10	10	9.4	8.5	8	9	9	8	8.5	9	9.9	9	8.3	8.6	9.02	A-
10	9.5	9	7	8.5	8.8	10	10	10	10	10	10	10	10	10	10	10	10	10	9.5	10	10	9.5	9.8	9.7	10	10	8.6	8.9	9.47	A
9	9	9.5	9.8	8.5	9.16	9	8	8.5	8	9.5	8.6	8.5	8	8	9	9	8.5	8.5	8	9	9	8	8.5	8.7	9.1	10	5.2	5.5	7.63	C
10	10	9.9	10	10	9.98	10	10	10	10	10	10	10	10	9	10	9	9.6	10	10	10	10	10	10	9.9	10	10	9.4	9.7	9.85	A+
9.8	9.8	9.5	9.5	9.8	9.68	8	9.5	10	10	9	9.3	10	9	9	10	10	9.6	10	10	10	10	10	10	9.6	10	10	9.4	9.7	9.76	A+
8.8	8.5	8.5	8.8	8.8	8.68	7	7	9	9	8	8	5	5	5	5	5	5	8	8	9	10	9.5	8.9	7.6	8.4	9	7.7	8	8.06	B-
9.5	9.8	10	9.5	8.8	9.52	9	9	10	10	9.5	9.5	9	9	9	9.5	9	9.1	10	10	10	10	9	9.8	9.5	10	10	8.06	8.3	9.17	A-
10	9.8	10	10	9.8	9.92	10	9.5	10	10	9	9.7	9	8.5	10	10	7	8.9	10	9	10	10	10	9.8	9.6	10	9.5	7.7	8	9.03	A-
10	9	9	9	10	9.4	9.5	9	10	10	9	9.5	8	7.5	9	10	9.5	8.8	9.5	9	10	9.5	10	9.6	9.3	10	9.5	9.3	9.6	9.58	A
7	7	8.5	7	8	7.5	8	7	8	8.5	8	7.9	8	8	9	9.5	9.5	8.8	8	7	9	9	8	8.2	8.1	8.91	8.5	8.6	8.9	8.622	B
																						AVERAGES		9.14	9.66	9.59	8.22	8.52	9.04	A-

To eliminate letter grades C, students are expected to establish a sustainable schedule with sufficient study time for technology courses, maintain a stable pace during the semester and remain active in their learning activities. Very clear outline of expectations at the beginning of the courses as well as warning of insufficient performance after mid-term are designed to assist students align with the classes' expectations.

The final exam in Environmental and Construction Technology III, where understanding of theory and principles is assessed, is often perceived as the most demanding part of technology courses. Instructors acknowledge that the exam design is not always in line with instructional level when students' performance falls uniformly outside expectation. Correctional moves, such as decrease of number of question or increase of examination time, incorporation of more critical thinking questions rather than "trap" question, and better clarification of study material and expectations helped with elevating student exam performance with the goal to stabilize average grades between 8 and 8.5/10.

Achieving an average grade >B+ hasn't recently presented a problem for the Technology courses. It is, however, always computed and accounted as an indication of classes good stand.

As an example, evolution of exam grades and final grades in Environmental Technology 3 over the past three years

are presented in Table 3.

Table 3

	Environmental Technology 3		
	2019	2020	2021
Avearge exam grade	7.1	7.3	8.2
Exam standard deviation	1.15	1.14	1.13
Average Letter Grade	B+	B	A-
Final Grade standard deviation	0.9	0.75	0.61

In the Environmental Technology series there are industry benchmarks used that allow students to evaluate their work as well as to use critical thinking with ecological input. On a building design level, those are

- Current energy codes: buildings that comply with current energy codes are identified as the minimum requirement for a building. This is used as the baseline against which they evaluate strategies and design approaches.
- Certification standards (i.e., LEED, WELL, Living Building Challenge): Buildings considered high performance often seek certification with one of the industry acknowledged standards, that provide to the students certain benchmarking criteria on building energy use, human health and wellbeing or whole project ecological thinking.
- AIA 2030 Challenge: Using the available tools from the 2030 Challenge (materials, strategies, zerocode, zerotool, etc.) students can benchmark their designs and understand the nuances of a net zero building.
- Simulations and analysis: students possess the tools to evaluate their designs against the previously mentioned benchmarks, understand the sensitivity of every parameter against performance and make design decision based on research and calculations.
- Climate change and operational adaptability: After accounting for climate change implications, it often becomes apparent that designing a net zero building is a challenging task. Flexibility and adaptability on a building operations level are explored as responses to this question and enhance students' critical thinking, exploration opportunities, and innovation potential.

Future goals for the M.Arch Technology series based on student feedback and best practice analysis include

- Establish assessment criteria for design integration in Technology IV classes
- Acquire and incorporate sensing equipment in the teaching activities that will give students the chance to study existing buildings through Post Occupancy Evaluation exercises
- Increase exposure to case studies, either through presentations or site visits

3.2 SC 5 – Design Synthesis

SUBMITTED APR TEXT

SC.5 Design Synthesis—How the program ensures that students develop the ability to make design decisions within architectural projects while demonstrating synthesis of user requirements, regulatory requirements, site conditions, and accessible design, and consideration of the measurable environmental impacts of their design decisions.

SC.5 PROGRAM RESPONSE

Courses Provided for SC.5:

B.Arch

ARCH 2501 – Architecture Design Studio IV
ARCH 3500 – Architecture Design Studio V
ARCH 3501 – Architecture Design. Studio VI
ARCH 4510 – Architecture Design Studio VII

M.Arch
ARCH 6603 – Design Studio III
ARCH 6604 – Design Studio IV
ARCH 6361 – Integrated Practice

1 PROGRAM APPROACH TO DESIGN SYNTHESIS

The design disciplines have often been described as "generalist," which entails the synthesis of many different variables into a single design solution and often at multiple scales simultaneously—from the city to the building to the object. Architectural design problems simultaneously engage with sociology, economics, politics, finances, ecology, environment, technology, materiality, territory, and form. The architecture curriculum at UHCoAD reinforces this synthesis while also offering depth in certain sub-specialties.

As a part of UHCoAD's approach to architectural education, we believe in a strong disciplinary core that asserts the centrality of design thinking. The elements of our curriculum reflect the values and ideas at the core of our College—while also reinforcing integration and congruities that synthesize the many aspects of a given architectural problem. These elements together help us as a College to identify our core values.

- *Design Thinking* grounds our understanding of studio and the built environment.
- *Media* unifies our way of thinking through visualization, representation, and the use of both software and physical tools.
- *Building Systems* expands our thinking about building technologies and their layered integration.
- *History, Theory, and Criticism* enhances our thinking about design culture as a critical and thoughtful domain.
- *Urban Systems* integrates thinking about cities and urbanism.
- *Ecological Thinking* expands our concepts of sustainability and stewardship.

The classes and specific bodies of knowledge offered at UHCoAD fit into the disciplinary areas listed above. These disciplinary areas, taken together, help shape students with both broad and deep knowledge—as well as the possibility for specialization within the context of the curriculum. Our goal is to produce capable designers at every scale, who care about stewardship of our shared resources.

Design Synthesis is essential to our teaching process at UHCoAD. It is integrated across both our undergraduate and graduate programs, as a core emphasis of every course offering: seminars, lectures, studios, community events (lectures and exhibitions), and faculty research; as well as through their collective aggregation. Our studio courses progress in an integrated ladder with increasing levels of complexity, expectations, and layers of synthetic thinking. In early design studios focused on the fundamentals, we introduce primary concepts of light, space, and material as well as questions of perception, the body, order, structure, and environment as a context of operation. These core conceptual lessons establish architecture as a medium in which the social and the material come together. Building upon this, the curriculum integrates deeper concepts of culture, context, history, spatial/site relationships, and building tectonics and performance. By the fifth semester of the B.Arch and the third semester of the M.Arch, students are able to design highly integrated buildings that further include consideration of sustainable principles, user needs, social context and program, primary urban concerns, environmental control systems, accessibility, primary and secondary structural systems, and formal and material detailing for conceptual and performative articulation in addition to other advanced issues. All of these items are expected to resonate with questions of site, urban context, the social realm, and the responsibilities of the built environment. Simultaneously, we synthetically integrate media to train students in the use of a variety of representational tools and media—from handicraft to digital, 2D to 3D, physical and virtual. These media are synthesized into the design curriculum in appropriate steps.

1.1 B.Arch Program Approach to Design Synthesis

At the beginning of the Undergraduate Architecture B.Arch Program, the Foundation level educates students in the use

of analog and digital tools to engage design in multiple capacities. In the first year of the degree plan, the Studio and Design Media academic areas work in concert to define—term by term—an evolving curriculum that is flexible enough to change with the arrival of new tools, approaches, and technologies.

In the first year, Design Synthesis is emphasized in every step of the learning process in ARCH 1500 and ARCH 1501, through exercises that condense critical thinking and architectural systems into graphic and material representations. Students learn fundamental design techniques for creating space, form, and mass, as well as graphic techniques for representing architectural ideas. These occur in parallel to skills-building exercises conveying drafting and drawing methods, physical modeling in a variety of materials, and computational thinking.

In the second year, architectural design is filtered thought a growing disciplinary knowledge. Our History, Theory, and Criticism curriculum works in dialogue with the ARCH 2500 and ARCH 2501 studios to inculcate in our students a critical approach to the discipline. Students are trained to understand the value of architecture works from different historical periods and to develop a language for discussing architectural theory and its paradigms. Precedent exercises develop students' capacity for deep analysis through the exploration of paradigmatic architectural works. They examine these works at the level of design concepts, programming, diagram, massing, plans, sections, elevations, and isometrics and multiple scale resolutions.

Based on this precedent analysis, students are invited to develop a new project formulating the relationship between input and impact of the precedent analysis and program and site new conditions. Design Synthesis becomes a key method for translating the understanding of precedent into new and reformulated architectural solutions against different environmental and program constraints.

In the third year, with an understanding of representational technique and theory, students focus on translating abstract ideas into material realities with the support of experienced design and technology faculty. In coordination with Intermediate Level studios of ARCH 3500 and ARCH 3501, the technology curriculum has recalibrated its syllabi to develop a set of projects that work in parallel and in connection with the design studio sequence. The Technology curriculum is evolving towards technology-focused studios. Students work in both areas at once in order to create a synthesized learning outcome merging technology with their design studio projects. In this sequence, design synthesis becomes key to articulating the complexities of the final resolution. Student projects holistically incorporate accessibility, building systems, regulatory context, user requirements, site conditions, and measurable environmental impacts. Drawings and diagrams demonstrate increasingly high resolution and detail, in an iterative process with faculty and external reviewers, to ensure a clear understanding of the element and the whole. ARCH 3500 emphasizes site analysis, dedicating half of the semester to exploring site conditions in the context of a complex building program and conceptual premise. The midterm reviews assess the actual relationship between environmental inputs and project resolution.

In the first term of the fourth year, the Comprehensive Studio Level ARCH 4510, Integrated Architectural Solutions reinforces the state of knowledge of the first three years of architectural education, emphasizing the learning outcome of Design Synthesis and the incorporation of increasingly deep approaches to Design Media, History, Theory and Criticism, and Technology. ARCH 4510, Integrated Architectural Solutions, is a condensed course where the coordination of all building systems, site analysis, environmental conditions, and cultural topics are resolved in a holistic understanding and representation of architecture. This semester culminates with a project that is a cross-section of the accumulated knowledge that students have gained over the past three years.

1.2 M.Arch Program Approach to Design Synthesis

In the Graduate Program, Design Synthesis is central to our curriculum. The sequence of graduate studios is designed to introduce students to new architectural concepts at a measured pace, synthesizing new ideas in sequence, culminating in a complete building integration project in the ARCH 6604 studio. Our studio sequence begins in Level I (M.Arch I), with the ARCH 6601 and 6602 sequence. In this sequence, students who are new to design engage in fundamental exercises for creating space, form, and mass, as well as graphic techniques for representing architectural ideas. These occur in parallel to skills-building exercises conveying drafting and drawing methods, physical modeling in a variety of materials, and computational thinking.

The Level III sequence is the point at which rising M.Arch I's and entering M.Arch II's merge within the graduate program. The two programs merge in the Fall Arch 6603 studio, titled "Contextualization". The intention of this studio is to examine questions of context in all of its architectural permutations: from cultural and historical context, to ecology, to urban form, to the internal context of buildings. The semester begins with exercises meant to hone students' analytical, design, and representation skills, before moving to a deeper and broader set of problems.

In Fall of 2021, Arch 6603 systemically engaged the complexities of urban and architectural development along the Gulf Coast within our ecologically precarious region, challenged by diverse development pressures. In this semester, students developed the ability to examine the broad forces and contexts in which architecture operates. The semester begins with a deep contextual and site analysis, using GIS, municipal, and other data systems to understand the geophysical characteristics of a given site: topography, urban density, scale, circulation, material context, as well as ecological variables such as climate, water systems, and flora and fauna. At the same time, they examine the sociocultural context of their given site, through the examination of cultural and material history, demographics, economics, anthropology, and related areas.

From there, students engage in a precedent analysis, the goal of which is an understanding not only of architectural history and form, but the ways in which architecture can be integrated into diverse contexts. Initial exercises in the Level III sequence focus on representational techniques, as well as combinatory and operative precedent analysis. For several years, we have run a short two-week project called "Sample Remix Mashup", in which students consider a canonical architectural residence (Farnsworth House, Villa Savoye, Villa Müller, etc) but now filtered through a new context with new uses. Students have to consider alterations to the project, as well as a full complement of drawings and diagrams: plans, sections, isometrics, collages. They analyze architectural works contextual relationships, program, space, mass, scale, material. We encourage the use of primary drawings, programming documents, plans, sections, elevations, and diagrams, as well as contextual photographs and architects' concept narratives. These precedents are collaborative exercises, with the intent of developing a deep rather than superficial understanding.

In the Fall of 2020, the Level III 6603 studio project was titled "Diaspora" and examined the way in which the global and local are intertwined, the creation of urban enclaves, and the realities of diverse cities. Each student picked an enclave in which to operate, considering its broad global influences, and the effects those influences can have on the local. The medium-scale building programs were developed by the students themselves, using the framework of a "center +" (a center plus _____). In each case students identified specific attributes of the local context to embed in their programs.
For Arch 6603 in the Fall of 2021, we examined the fragile conditions of Gulf Coast cities, looking specifically at New Orleans and the Mississippi Delta. We examined questions of urban and cultural context, land use, development, urban growth, flooding, water, and related issues. The two projects were a small weather monitoring pavilion (four weeks) and a large scale multi-use market hall at the edge of New Orleans' French Quarter (nine weeks). The first project engaged with site, structure, materiality, and fabrication, while the second engaged with large-scale programs, complex urban sites, adaptive reuse, historic and civic space, structural long spans, and the complexities of water management in New Orleans.

The Arch 6604 studios in the Spring are specifically tailored toward building integration, and always involve the semester-long design of a multi-story medium-scale public building. The programs are usually civic: museums, libraries, cultural centers, mixed-use housing. This studio has been titled "Synthesization" for several years, underscoring its integrative and combinatory approach. In the Spring 2021 6604 studio, students designed a multipurpose pool house and recreation center for Barton Springs in Austin, Texas. The building engaged with a diversity of constituents, in keeping with our College's inclusive mission. Central to the project was an intensive examination of heating, cooling, and ventilation systems, as well as the management of water, materials, programs and diverse user groups. In Spring 2022, graduate students will design a live-work housing development for the historically Black Third Ward neighborhood in which the University of Houston sits. Other projects have included Mass Timber housing in New York City and a public "unnatural history" museum on Seattle's waterfront. Increasingly, we are integrating seminars and

studios together so that both academic and design content is mutually reinforcing.

2 CURRENT ASSESSMENTS AND BENCHMARKS

Design Synthesis assessment is performed in different formats in the B.Arch and M.Arch programs. Midterm and final reviews, juries, and discussions are primary formats for assessments, with reviewer feedback, rubrics, and grading as the methods of assessment. Design juries are organized with guests from both the profession and academia (both internal and external reviewers). Guests provide critique and commentary on student projects comprehensively, alongside our internal faculty. Faculty record feedback and report back to students. Invited external guests' complete rubrics that are incorporated alongside our internal evaluations to generate grades. In addition, comprehensive narrative notes are taken for both process critiques and formal reviews—these are supplied to the students as additional specific feedback.

We currently apply a number of assessment and benchmark criteria in our courses, with ambitions to strengthen and expand our assessment procedures in our evaluation of courses. Below, we explain the current approach to evaluation in the following classes:

In the B.Arch

ARCH 2501 – Architecture Design Studio IV
ARCH 3500 – Architecture Design Studio V
ARCH 3501 – Architecture Design. Studio VI
ARCH 4510 – Architecture Design Studio VII

In the M.Arch

ARCH 6603 – Design Studio III
ARCH 6604 – Design Studio IV
ARCH 6361 – Integrated Practice

2.1 B.Arch Current Assessment and Benchmarks

B.Arch Program Approach to Assessments of:

Context.-
Over the academic years of 19/20, 20/21 and 21/22 the B.Arch Program has changed its assessment routines to the ones stablished before. Grad and Undergrad have collaborated and discuss the best mechanism to do a consistent assessment format for both programs. The new assessment method of UGA has introduced two structural changes:

- 1/ Incorporation of the roll of the external reviewers instead of internal.
- 2/ Review of complete contents of strategic studio courses by stablishing a series of rubrics per course.

In each course, the rubrics containing the particular focus about the following topics (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 (EXPECTED) or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee for the B.Arch.

For the Design Synthesis learning objective, ARCH 4510 is designated as a benchmark for the program assessment. However, ARCH 3500 Architecture Studio V and ARCH 3501 Architecture Studio VI are contributing to the assessment process and are designated benchmarks to observe the evolution of this learning objective at the course level prior to the program assessment at ARCH 4510. Initial evaluation points relative to coursework assignments related to this specific learning objective of Design Synthesis will include topics such as:

- User requirements,
- Regulatory requirements,
- Site conditions,
- Accessible design, and considerations of the measurable environmental impacts,
- Urban systems
- Building systems
- Architectural design problems that simultaneously engage with:
    - sociology,
    - economics,
    - politics,
    - finances,
    - ecology,
    - environment,
    - technology,
    - materiality,
    - territory,
    - form,
    - culture,
    - context,
    - history,
    - spatial/site relationships,
    - building tectonics and performance

For the three courses of ARCH 3500, ARCH 3501 and ARCH 4510 assessments are performed at the Midterm Reviews, the Final Reviews and at the assessment's sessions. Midterm Reviews assessment are conducted internally to anticipate and discuss results in preparation of Final reviews. Midterm and Final Reviews are organized as follows:

- The midterm reviews are assessed by internal reviewers. Reviewers are organized as follows: For the Midterm Review, each course section organize a board of reviewers. The reviewer's board is formed by 3 members: 2 internal faculty, one from another section of the same course, another from a different studio-level or academic area, and 1 upper-level student. Rubrics are filled and returned to the faculty for feedback, assessment and data collection.
- Final Reviews are assessed by external reviewers. A reduced number of sections of each course level (ARCH 3500, ARCH 3501 and ARCH 4510) are selected randomly to be reviewed by external reviewers. The external reviewers are expected to return one fulfilled rubric per student/per section. Data is collected and analyzed.
- Assessment sessions. At the end of each semester starting in last Fall 20, all studio faculty meet with the course faculty and present to the rest of the group one high pass, one average and one low pass in addition to the course premise. Meetings have been recorded and share with faculty for consultation since Fall 20. Discussions after presentations help the group to finalize grades having the overview of all similar sections and upper and lower levels.

This process has been developed over the past two and a half Academic Years. Rubrics have been discussed and progressively implemented in the course schedules but assessment has not been not fully completed as described above for each semester.

SC.5_Assessment Sequence. _

The architectural learning outcomes of Design Synthesis is assessed in the course ARCH 4510, Integrated Architectural Solutions, at the program level. However, this learning outcome is also assessed at courses level across curriculum starting at the Intermediate Level in the course Architecture Design Studio IV ARCH 3500 and continue through the course Architecture Design Studio V ARCH 3501 towards ARCH 4510 as contributing to assessment elements. The sequence of learning outcomes for the Design Synthesis is a sequence of implementation from course to course. Progressively courses include higher number of expected elements in the students designed work, such as user requirements, regulatory requirements, site conditions, accessible design, and considerations of the measurable environmental impacts. The program works to ensures that students develop the ability to make decisions of all previous items within architectural projects and courses' prompts are structured in an implemental scale/program sequence that facilitate the acquisition of them:

Concepts, Program Types, Site, SF

	1501	2500	2501	3500	3501	4510
GENERAL TOPIC	**Pavilioned**	**Domesticity**	**Hybridity**	**Infrastructure**	**Made in Houston**	**Annexed**
CONCEPTS	Precedent driven. Low performance.		Precedent driven. Spatial Topologies. Urban Context	Site driven. Contextual architecture. Environmental awareness	XXL/urban/territorial Scales (Bigness) vs M/architecture Scales	Equity/Social Justice
PROGRAM TYPE	Atrium Pavilion	**AY 20/21** Multifamily + **AY 21/22** House +	**AY 20/21** Sports, Classrooms, Coffee Shop, Book Shop **AY 21/22** Housing, +, parking.	**AY 20/21** Recycling plant **AY 21/22** Recycling plant	**AY 20/21** Architecture of The Speedway **AY 21/22** TBD	**AY 20/21** DEI
SITE			Houston - Saint Thomas University - Signified with DEI bias	Houston - Brady's Island - Signified inequity by inappropriate combination of urban elements	Houston - Attached to Urban/Met Infrastructures - Signified with inequity by disruption over existing communities	National -
SF	1K sf	3-5K sf	20K sf	**35K sf**	25K sf	15K sf

Scales

1501	2500	2501	3500	3501	4510
	Multiple Scales - Site Plan and Section Built Environment representation **1/32"** All Plans **1/32"** All Elevations **1/32"** Sections (2 min) **1/16"** Integrated + Exploded Axonometric **1/16"** 1 Plan **1/16"** 1 Section **1/16"** 1 Elevation **24x36** Emblematic Image /Materiality	**Multiple Scales -** Site Plan and Section Built Environment representation **1/16"** All Plans **1/16"** All Elevations **1/16"** Sections (2 min) **1/8"** Integrated + Exploded Axonometric **1/8"** 1 Plan **1/8"** 1 Section **1/8"** 1 Elevation **24x36** Emblematic Image /Materiality	**Multiple Scales -** Site Plan and Section Built Environment Development **1/16"** All Plans **1/16"** All Elevations **1/16"** Sections (2 min) **1/8"** Axonometric or **1/4"** Section Perspective. **1/4"** 1 Plan **1/4"** 1 Section **1/4"** 1 Elevation **24x36** Emblematic Image	**Multiple Scales -** Site Plan and Section **1/16"** Site Plan: accessible path to parking, transit, public sidewalk, but environment development **1/8"** All Plans **1/8"** All Elevations **1/8"** Sections (2 min) **1/8"** Axonometric - Integration **1/4"** 1 Plan **1/4"** 1 Section **1/4"** 1 Elevation **1 1/2"** / Details (Wall, Joint, Roof) **24x36** Set Emblematic Images (2 min)	**1/16"** / Site Plan: accessible path to parking, transit, public sidewalk, landscape development **1/16"** / Site Plan / Massing Axonometric with quantitative solar orientation analysis **1/4"** / Building Plans (all) **$/sf** quantitative analysis + alternative cost **1/4"** / Building Sections (2 min.) **1/4"** / Building Elevations(2 min.) **1/4"** / Integrated HVAC / MEP Plan or Axonometric **1/4"** / Integrated Structural Plan or Axonometric **1 1/2"** / Building Envelope WallSection

SC.5 Assessment at ARCH 3500

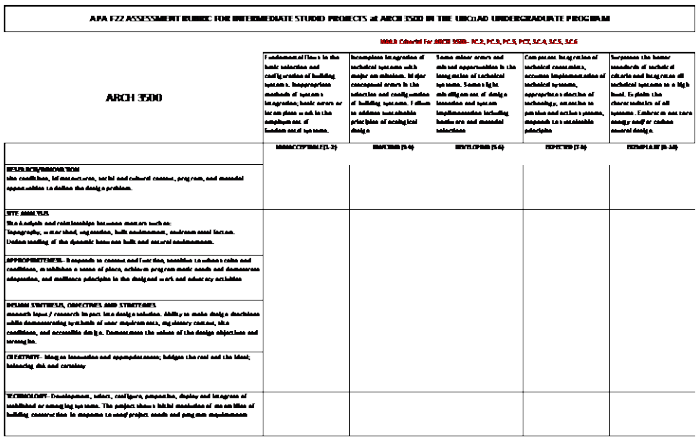
At ARCH 3500 Design Synthesis learning outcome is observed in its first assessed stage of the sequence with the lower scope of project scale factors and focused in the immediate relationships stablished between the building and the site, including elements such as accessible design and initial regulatory requirements. Design

Synthesis is ajoined to two other elements for assessment: Design Objectives and Design Strategies, both related to how the Intermediate Level transit from abstract ideas to material forms. For this specific learning outcome, the assessment's rubric used for the benchmarks of Midterm and Final reviews includes the following assessment item:

- 1/ DESIGN SYNTHESIS, OBJECTIVES AND STRATEGIES: research Input / research impact into design solution. Ability to make design decisions while demonstrating synthesis of user requirements, regulatory context, site conditions, and accessible design. Demonstrates the values of the design objectives and strategies.

This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Exemplary. The B.Arch program sequence is expecting at the end of this course that 80 % of the students' designed work demonstrate the integration of previous item 1/ into the project by rating EXPECTED or better on average. The impact of the research is expected to be evident in the project's resolution and ideas.

ARCH 3500_ Assessment Rubric:



ARCH 3500				

SC.5 Assessment at ARCH 3501

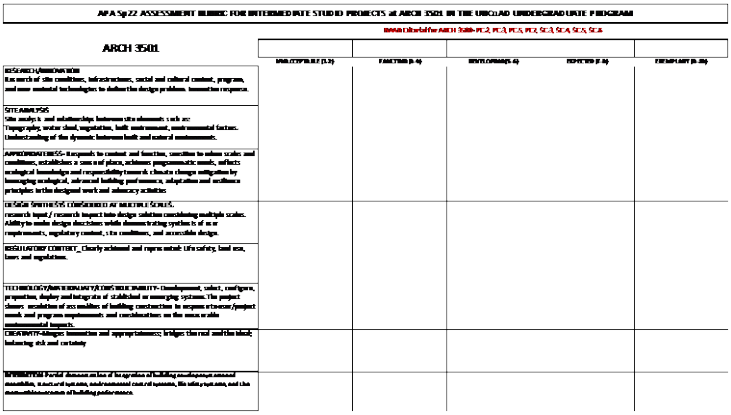
At Arch 3501 Design Synthesis learning outcome is observed in its second assessed stage of the sequence with the increased scope of project scale factors and focused in the diverse relationships stablished between the building and the site and the urban condition of infrastructures, as well as integrates accessible design, and the regulatory requirements. The coordination of this course with the technological course ARCH 3328 Technology 4 focused on Environmental systems instill the ability to make design decision to consider the measurable environmental impacts in the student's design decisions and are represented in the appropriate used of building technology. For this specific learning outcome, the assessment's rubric used for the benchmarks of Midterm and Final reviews includes the following assessment items:

- 1/ DESIGN SYNTHESYS CONSIDERED AT MULTIPLE SCALES: research Input / research impact into design solution. Ability to make design decisions while demonstrating synthesis of user requirements, regulatory context, site conditions, and accessible design. Demonstrates the values of the design objectives and strategies.
- 2/ REGULATORY CONTEXT_ Clearly achieved and represented: Life safety, land use, laws and regulations.
- 3/ TECHNOLOGY/MATERIALIATY/CONSTRUCTABILITY- Development, select, configure, proportion, deploy and integrate of technology in response to user/project needs and program requirements and considerations on the measurable environmental impacts.

In addition, the site's infrastructures, social, cultural, and historical conditions are considered learning outcomes of the course load.

This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Exemplary.The Course ARCH 3501 assessment output is expecting at the end of this course that 80 % of the students' designed work demonstrate the integration of previous items 1/, 2/ and 3/ into the project by rating EXPECTED or better on average.

ARCH 3501- Assessment Rubric:



APA Sp.22 ASSESSMENT RUBRIC FOR INTERMEDIATE STUDIO PROJECTS at ARCH 3501 IN THE UNDERGRADUATE PROGRAM					
	Benchmarks for ARCH 3501- PI: 1, PI: 2, PI: 3, PI: 4, PI: 5, SC: 1, SC: 2, SC: 3, SC: 4, SC: 5, SC: 6				
ARCH 3501	UNACCEPTABLE (1.5)	FAULTING (2.5)	DEVELOPING (3.5)	EXPECTED (4.5)	EXEMPLARY (5.25)
RESEARCH/PROGRAM: Research of site conditions, infrastructures, social and cultural context, program, and some material technologies to define the design problem. Innovative response.					
SITE ANALYSIS: Site analysis and relationships between site elements such as: Topography, water cloud, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.					
APPROPRIATENESS- Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs, reflects ecological knowledge and responsibility towards Climate change mitigation by leveraging ecological, advanced building performance, adaptation and resilience principles in the designed work and advocacy activities					
DESIGN SYNTHESIS CONSISTENCY AT MIDTERM REVIEW: research input / research impact into design solution considering multiple scales. Ability to make design decisions while demonstrating synthesis of user requirements, regulatory context, site conditions, and accessible design					
REGULATORY CONTEXT_ Clearly addressed and represented: life safety, land use, laws and regulations.					
TECHNOLOGY (Sustainability/Resiliency)- Considered, select, configure, programme, deploy and integrate established or emerging systems. The project shows resolution of ass emblies of building construction in response to user/project needs and program requirements and considerations on the measurable environmental impacts.					
CREATIVITY- Unique: Innovative and appropriateness; bridges theoretical and technical; balancing risk and curiosity					
INTEGRATION: Partial demonstration of the integration of building envelope, structural assemblies, mechanical systems, environmental control systems, life safety systems, and the constructability aspects of building performance.					

SC.5 Assessment at ARCH 4510

At ARCH 4510, we are assessing Design Synthesis at program level. The students are expected to demonstrate ability to make decisions within their architectural projects while demonstrating synthesis of the user requirements, site conditions, and accessible design, and considerations of the measurable environmental impacts. At this stage, Site Orientation and Climate (Sustainable Design Principles), Envelope (Sustainable Design Principles), Heating, Ventilation, AC (Sustainable Design Principles) and Materials (Sustainable Design Principles), are learning outcomes that have been implemented progressively over the studio courses ARCH 3500 and ARCH 3501 and Technology Courses ARCH 2327, ARCH 2328, ARCH 3327, ARCH 3328 and ARCH 4327 to be achieved at full capacity at ARCH 4510. The assessment's rubric to assess Design Synthesis for the benchmarks of Midterm and Final reviews of ARCH 4510 focus Design Synthesis as one particular element in a difference to the previous contributing courses.

This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Exemplary. The B.Arch program assessment output is expecting at the end of this course that 80 % of the students' designed work demonstrate the ability of Design Synthesis by rating EXPECTED or better on average.

ARCH 4510 Assessment Rubric:

Checklist for ARCH4510 Final Juries – Fall 2021
TEAM _____

(please score lowest to highest)		not met 1	2	adequate 3	4	exceptional 5	
1/	Solar Orientation/Sustain notes	1	2	3	4	5	
2/	Site Plan Accessibility notes	1	2	3	4	5	
3/	Life Safety Plan notes	1	2	3	4	5	
4/	Structure Integration notes	1	2	3	4	5	
5/	Envelope Design notes	1	2	3	4	5	
6/	MEP Integration notes	1	2	3	4	5	
7/	Materials Selection Notes	1	2	3	4	5	
		___	___	___	___	___	SUBTOTAL ___
Other Notes:							
	Design Synthesis/Response notes	1	2	3	4	5	
	Graphic Representation notes	1	2	3	4	5	
	Technical Understanding Notes	1	2	3	4	5	
		___	___	___	___	___	TOTAL ___

2.2 M.Arch Assessment and Benchmarks

In the M.Arch program, ARCH 6603 and ARCH 6604 studios currently use four criteria (Craft, Intellectual Clarity, Completion, and Construction) to assess student work through a rubric that allows for evaluating student success in these areas.

We evaluate our students in a variety of formats. For project assessment and information, as mentioned above, we engage with design professionals as guest lecturers and reviewers, to provide well-rounded feedback from numerous perspectives. We use design juries, pinups, desk crits, and presentations to give comprehensive feedback to our students. Feedback is recorded and submitted back to the students as both a written narrative and in a grading rubric. Students hear the information once in a spoken review, and then receive written notes afterward reinforcing the review comments. We also ask our reviewers to provide written notes after the review as a third point of learning. This feedback is incorporated into our grading rubric. We feel the combination of the rubric as well as narrative explanations and commentary is essential.

The current assessment rubric in the M.Arch studio courses ARCH 6603 and 6604 emphasizes Design Synthesis. It is based on a several criteria, with a scale of 1-5 in each area. Each of these elements falls under one of four broad rubric categories: Construction, Craft, Intellectual Clarity, and Completion. These elements are considered in addition to other assessment areas as a part of an overall grade.

Our Design Synthesis approach begins with analysis—in order to understand broad context—before moving to application of design approaches. We measure each student's ability to make decisions demonstrating both the understanding and integration of existing elements in the urban landscape. As an early part of the design process, students are asked to understand and analyze:

- User Requirements (through pre-design, programming, site + context analysis, survey data, and interviews)

- Regulatory Requirements (analysis of land use, zoning, building and life safety codes)
- Site Conditions (Analysis of geophysical characteristics such as topography, geomorphology, climate, flora/fauna)
- Urban Systems (urban context, land use, urban scale, vehicle and pedestrian circulation, etc.)
- Accessible Design
- Environmental Factors and Impacts
- Architectural Precedent (considered in terms of contextual relationships, program, space, mass, scale, material)

These elements form a framework for understanding architectural approaches. We seek a broad knowledge of the myriad forces at play in any architectural project before beginning design work.

From there, in measured steps, we approach the following design issues (always with a reference to the existing site conditions and underlying regulatory contexts):

- Architectural Precedent (returning now as an operative tool)
- Sociology (using demographic and cultural information as well as pre-design and programming data)
- Culture and History (both of sites and of the general region, including both material and cultural history)
- Ecology and Environment (climate/weather, geomorphology, flora/fauna, historical pollution and remediation)
- Territory (Broader sociocultural, political, and physical forces as they affect projects)
- Form (including questions of scale, mass, shape, transparency/opacity, and material)
- Spatial/Site Relationships (architectural approaches to connection and integration of surroundings)
- Building Systems (including structure, HVAC, materials, sustainable systems)
- Building Tectonics and Performance (Data-driven approaches to systems integration and building assessment)
- Technology (approaches to integration of both current and innovative/new technologies)
- Materiality (involving haptics and sensory systems, as well as material flows, costs, and logistics)
- Financing (examining the broad economic forces involved in architecture, as well as specific costing)

In each case, students compare and contrast their strategies with industry standards, in collaboration with their architect-instructors as well as with external engineers, code consultants, sustainability experts, programming consultants, and others. The feedback from these consultants is then folded into our student evaluations and grading processes, including our assessment rubric where criteria are evaluated on a 1-5 scale.

GRADING RUBRIC ARCH 660X — Scale of 1-5

CRAFT		INTELLECTUAL CLARITY		COMPLETION		CONSTRUCTION	
Is the project attentive to questions of scale, space, proportion and atmosphere?		Are the contextual elements used in the project concept clear? (i.e. are history, culture, urban and geophysical context clearly referenced?)		Is the project represented in such a way that it is fully understandable?		Is the construction assembly of the project realistic in terms of architecture industry standards?	
Are digital and physical models well made? Do they indicate space, transparency, opening, solidity, and structure clearly?		Are the parti and massing elements in the project clear? Is there an apparent logic and sequence to how these elements were developed and how they interrelate?		Are the requirements and deliverables for the studio met?		Are building systems (structure, MEP, material etc) represented correctly through drawing, diagrams, and imagery?	
Are renderings and collages clear in their construction? Do they explain the architecture in terms of space, scale, proportion, light, and material?		Do the building systems (structural, atmospheric, material) follow from the project concept?		Do the drawings and images contain everything needed to accurately convey the project?		Are references made to industry standards in terms of construction, codes, and regulations?	
Do diagrams clearly explain how the project works?		Is the project as a whole legible? Do the individual parts, drawings, and images support the larger concept?		Was the student attentive to feedback and to revisions in the design process?		Does the student demonstrate an understanding of how their building would be assembled?	
Are the drawings well-crafted according to architectural standards? Are line weights and other drawing elements clear?		Does the project reference or make use of common understandings of architectural knowledge?		Did the student engage with the instructor and other students in a productive, collaborative way?		Do building systems in the project work together?	

Here is an example of the applied grading matrix with no student names:

ARCH 660X LEVEL II GRADES

	Project 1.1 + 1.2					Project 2 Midterm							Project 2 Final							
STUDENT	Clarity	Craft	Completion	Construction	TOTAL	Clarity	Craft	Completion	Construction	TOTAL	MIDTERM TOTAL	MIDTERM GRADE	Clarity	Craft	Completion	Construction	TOTAL	PARTICIPATION, COLLABORATION, LEADERSHIP	FINAL TOTAL	GRADE
	3	3	3	2	2.75	3	1	2	2	2.00	2.38	C+	3	2	2	2	2.25	3.00	2.4	C+
	4	3	3	3	3.25	4	3	3	3	3.25	3.25	B+	4	4	4	3	3.75	4.00	3.6	A-
	4	4	4	4	4.00	4	4	5	4	4.25	4.13	A	5	3	4	4	4.00	3.00	4.0	A
	4	4	3	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	4	4	3.50	3.00	3.4	B+
	4	3	4	4	3.75	3	4	4	4	3.75	3.75	A-	5	4	4	3	4.00	4.00	3.9	A
	3	2	4		3.00	3	3	4	3	3.25	3.13	B	3	3	4	3	3.25	4.00	3.3	B+
	4	3	4	3	3.50	3	3	4	3	3.25	3.38	B+	3	3	3	3	3.00	2.00	3.1	B
	4	3	3	3	3.25	3	3	3	3	3.00	3.13	B	3	2	3	3	2.75	2.00	2.8	B-
	2	2	1	2	1.75	2	2	1	3	2.00	1.88	C-	2	2	1	2	1.75	2.00	1.8	C-
	3	3	3	3	3.00	3	3	3	3	3.00	3.00	B	4	3	2	3	3.00	3.00	3.0	B
	4	4	3	3	3.50	4	3	3	3	3.25	3.38	B+	4	3	2	3	3.00	4.00	3.3	B+
	3	4	4	4	3.75	4	3	4	4	3.75	3.75	A-	5	3	4	3	3.75	3.00	3.7	A-
	4	4	4	3	3.75	3	4	4	4	3.75	3.75	A-	4	5	4	5	4.50	3.00	4.0	A

The grading rubric and matrix act as a feedback loop, allowing us to assess feedback and revisions continuously throughout the semester. These matrices can then be compared across semesters. Graduate students at UHCoAD must maintain a "B-" average (2.67 GPA or higher) across all classes in order to remain in good standing. If students fall behind, we allow for a two-semester probation period, and work closely with them to improve their work.

Each semester, evaluations are compared to similar work performed in previous semesters and years. In these comparative evaluations, we look at the quality of both integration and representation. Through numerous semesterly meetings with the studio faculty and coordinator, we evaluate the integration of parallel sections as a singular team-taught unit—as well as conversations with the Director of Graduate Studies and the Graduate Committee. The curriculum is systemically reevaluated through the feedback loop of the micro and macro expectations. We actively seek student feedback on project types, workload, learning goals, and our own instruction. We also use industry standards as a continuous set of benchmarks—provided by both our instructors and our invited guests. Lastly, we examine the general state of discourse at other architecture schools to understand the pedagogical direction of the profession as well as the criteria and benchmarks used both nationally and internationally. We engage in assessment and course correction based on both guest and student feedback every semester.

For instance, we discovered in our grading in Spring 2020 that our broad rubric categories did not capture issues of building assembly, systems, and regulation. For many years, we had used the three broad categories Clarity, Craft, and Completion, with building systems issues falling mostly under Craft. In Fall 2021, we added the category Construction, along with questions and performance indicators that related to building systems and integration. This allowed for more precision in our assessments. As another update to our assessments, we felt at the end of the Fall 2021 semester that students had difficulty with the scale of the current project. In both Spring and Fall, we plan to

begin with small-scale, compact design exercises with very precise assessment criteria, before working up to larger and more complex project aspects later in the semester. These “course corrections” occur every term.

3 EVIDENCE

UHCoAD provides a number of elements to the NAAB visiting team as evidence of Design Synthesis. The most comprehensive evidence programs provide complete student projects, in addition to course materials, including syllabi, handouts, course reader of M.Arch .for all levels, and B.Arch. for Foundation Level. The B.Arch. and M.Arch. goal is always to ensure that the complexities of an integrated building project are presented clearly. Recorded faculty discussions on design, lectures, and presentations of instructors and guests are provided through our digital archive. We are also providing copies of our assessment and grading rubrics.

4 FUTURE DEVELOPMENTS AND BENCHMARKING

Design Synthesis is a core value of UHCoAD. As such, B.Arch. and M.Arch. programs are continuously evaluating students' ability to incorporate complex information at core and high levels. As programs move forward, a discussed goal is refining how evaluative feedback loops work, so that faculty can help students to clarify the many dimensions of their projects. Programs are also working to include a more significant number of voices and perspectives from outside the College—as critics, as lecturers, and as mentors. The B.Arch. and M.Arch. programs' goal is to plug into the local, national, and international architecture discourse so that what the faculty teach in both programs shows awareness of what is broadly relevant and contemporary.

As a part of this future development, we are also working to refine our assessment processes, with the goal of providing better feedback for how we approach Design Synthesis. We plan to implement more comprehensive rubrics extended into all classes. These will be evaluated on a scale of 1-10 (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

3.2 SC 6 – Building Integration

SUBMITTED APR TEXT

SC.6 Building Integration—How the program ensures that students develop the ability to make design decisions within architectural projects while demonstrating integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems, and the measurable outcomes of building performance.

SC.6 PROGRAM RESPONSE

Courses Included in Response to SC.6:

B.Arch

ARCH 3500 – Architecture Design Studio V
ARCH 3501 – Architecture Design Studio VI
ARCH 4510 – Architecture Design Studio VII

M.Arch

ARCH 6A48 – Environmental Tech III
ARCH 6A50 – Construction Technology III
ARCH 6603 – Design Studio III
ARCH 6A49 – Environmental Tech III
ARCH 6A51 – Construction Technology IV
ARCH 6604 – Design Studio IV
ARCH 6361 – Integrated Practice

1. PROGRAM APPROACH TO BUILDING INTEGRATION

Building Integration is threaded through our entire ladder of design studios and technical coursework at UH with particular attention in ARCH 4510 in the B.Arch program and 6604 in the M.Arch, in partnership with their parallel technology course ARCH 4327 Technology 5 in the B.Arch program and seminars ARCH 6A48, ARCH 6A49, ARCH 6A50, ARCH 6A51 and ARCH 6361 in the M.Arch program. In addition to social and cultural aims, architecture requires the integration of complex technical systems in order to work, including structure, material systems and assemblies, envelope, sustainability, environmental control, and life safety. The ability to wield these "technical" performative instruments—while still addressing issues of context, culture, form and space, etc.—is the hallmark of good architecture. In this sense, architecture must be responded in both form the ~~both~~ abstract concepts ~~and~~ to the specific solutions at once, integrating high levels of technical information while also plugging into diverse topics such as community and contexts, programs and performative criteria.

B.Arch and M.Arch curricula introduce the technical aspects of architecture and building performance in layered stages. In the earliest semesters, students consider the fundamental principles of geometry, materiality, space's human dimensions, structure, and typology as central elements in their designs. Design Studios and Tech courses are closely integrated with synchronized curricula that share project contents as a vehicle for overlapping and integrated learning. Programs try to create an environment in which Tech and Studio instructors work in concert as a collaborative team: decisions about materiality, programmatic type, spatial organization, or systems are never far considered from questions of airflow, structure, shading, or embodied energy. Programs raise these synergies early and emphasize them at every step, embodying the principles of the curriculum delivery as a principle of practice. As the semesters progress, the integration of the technical with the architectural becomes more complex, nuanced, and sophisticated.

By roughly the halfway point in both B.Arch and M.Arch degree programs, the curricula of both programs offer a specific Integration/Synthesization studio (ARCH 4510 in B.Arch and ARCH 6604 in M.Arch), a deep and comprehensive building design project. These Integration/Synthesization studios specifically address the complexities involved in the making of architecture: building envelope and assemblies; structural systems; environmental control systems; life safety systems; building performance; accessibility and codes and regulations—as well as questions of site integration; complex programming; and sustainable and passive solar strategies. Programs introduce students to the many layers and valences of a complete architectural project. This semester's studios progress in measured steps, with many points of feedback and iteration using both narrative and rubrics.

1.1 B.Arch Program Approach to Building Integration

Sequence._
The learning outcomes of Architecture Design Studio at the Foundation, Intermediate, and Comprehensive levels are conducted in sequence. The architectural learning outcomes sequence that capitalizes most appropriately at the Comprehensive level learning outcome of Building Integration starts at the Intermediate Level in the course ARCH 2501 - Architecture Design Studio IV and concludes at the Comprehensive Level in ARCH 4510 - Integrated Architectural Solutions. The sequence implements programmatic elements, scales of resolution and definition, and methods of representation. This series of elements are coordinated as follows:

As the main element of the sequence the building integration learning outcome starts at the basis of the Intermediate Level and culminates at ARCH 4510. For this specific element, the three-dimensional representational tools and

incremental two-dimensional representation of complete plan and sections of the full building proposed are gaining relevancy each semester and accumulate all the experience of integration at the Level of ARCH 4510 with axonometric representation as the selected tool capable of demonstrating the higher Level of readable and realistic building integration.

Intermediate Level general description: ARCH 2501, ARCH 3500, ARCH 3501_
As the preparatory sequence to the one-course Comprehensive Level, the Intermediate Design Studios include students in their Fourth, Fifth, and Sixth semesters of Architectural Design Studies. The sequence provides students with an opportunity to work in the structure of a system that moves from Design Methods to Material Practices and evolves from abstract tools to material realities. Initiating the sequence with an intense exploration of design methods, students are educated in the analysis, representation, and criticism of architectural works by designing a project in parallel to understanding the architectural discourse. This semester runs in conversation with the History, Theory, and Criticism academic area. The second Intermediate design studio, Design Strategies, develops students' capacity to make choices and assess their own routines in order to achieve concrete objectives of the final architectural work and built environment, technically and culturally. The third Intermediate design studio, Material Practice, develops students' capacity to understand how architecture operates simultaneously with abstract tools and material realities. As the last semester of the intermediate Level, the studio format allows students to explore architectural modes of practice. Focusing on the role of architecture in complex urban contexts, the students reinforce the ability to work with multiple scales, from urban infrastructures to building forms. Concluding the intermediate sequence, this semester emphasizes students' ability to demonstrate technical knowledge of different aspects of materiality, constructability, environmental responsibility, regulatory context, economics, politics, and/or building performance.

ARCH 2501
The first semester at the Intermediate Level, ARCH 2501 focuses on welfare values and safety applied to human dimensions and are represented in elements such as stairs and ramps dimensions and characteristics, egress conditions, and standard dimensions of hallways, doors, rooms and bathrooms standard dimensions. ARCH 2501 is the first course focused on more complete building designs, including a few multiple floors, structure, and programmatic diversity in the bigger scope of the square footage of a building designed in an urban context. At the end of ARCH 2501, The B.Arch program sequence is expecting that 80% of the students will have proficiency of building integration of design basics of dimensionality and safety, earning an average rating of "Acceptable" or better. With this purpose ARCH 2501 is coordinated with the technological course of ARCH 2328 Technology 2 which main topic is structural systems. The coordination of these two courses, ARCH 2501 and ARCH 2827, supports the acquisition of structural systems knowledge and design to better integrate ideas and building technologies.

ARCH 3500
At ARCH 3500 the complexity grows towards integrating the external building realities such as climate, solar radiation, and rain site conditions, also explored as site's hydrospheric, lithospheric, atmospheric, and biospheric conditions, to implement the ecological knowledge and responsibility of design. In addition, the site's infrastructures, social, cultural, and historical conditions are considered learning outcomes of the course load. The B.Arch program sequence is expecting at the end of this course that 80 % of the students' designed work demonstrate the ability to integrate the research outcomes of the external building realities into the project. The impact of the research is expected to be evident in the project's resolution and ideas. In addition, ARCH 3500 includes requirements of technical documentation of the following list to be as developed as possible: structural systems, MEP indications, constructability, and material forms. These elements are expected to included, mentioned and or drafted but we accept the list to be full or partially accomplished and developed at schematic level.

Additionally, ARCH 3500 is coordinated with the technological course of ARCH 3327 Technology 3. For several academic years and until the fall semester of the academic year 21/22, Technology 3 main topics have been focused on both structural systems and building environmental systems. The expectation of this coordination effort is the better integration of ideas and building technologies.

ARCH 3501

Architecture Design Studio VI, ARCH 3501, is the culmination of the Intermediate Level. At this course level, the expectation is that most of the students will be proficient on all previous building integration learning outcomes of ARCH 2501 and ARCH 3500 to be prepared to respond at the end of the semester with an architectural solution that includes several different scales and demonstrate proficiency of integrating in the building resolution all aspects of constructability, safety, welfare, building envelope systems and assemblies, structural systems, environmental control systems, life safety systems and measurable outcomes of building performance. To achieve this goal ARCH 3501 includes most of the learning outcomes expected in the next course level of ARCH 4510 but with expectations on highly understanding and demonstrating of all them but accepting a soft achievement of the 100% of the expected ones in the next level. The B.Arch program sequence is expecting at the end of this course that 80 % of the students' designed work demonstrate the ability to integrate and develop most of the elements listed previously as well as present a set of comprehensive documentation that shows proficiency on building integration capacities.

Additionally, ARCH 3501 is coordinated with the technological course of ARCH 4327 Technology 4. For several academic years and until the Spring semester of the academic year 20/21, Technology 4 main topics have been focused on both structural systems and building environmental systems. The expectation of this coordination effort is the better integration of ideas and building technologies.

ARCH 4510

The comprehensive (integrated practice) level studio in the undergraduate program is ARCH 4510 Integrated Architectural Solutions. It seeks the integration of the architectural idea with building materials and systems that express that idea at a conceptual level. Spatial qualities and architectural form must be informed by the selection of structural, environmental, material assembly systems, and the character of natural light as influenced by the context, site, and program early in the design process. Further design determinants include egress and life safety, accessibility, and building regulations all of which must be understood by the students at the beginning of the design process.

Spatial qualities and architectural form must be informed by the selection of structural, environmental, material assembly systems, and the character of natural light as informed by the context, site, and program early in the design process. Design determinants include egress and life safety, accessibility, and building regulations all of which must be understood at the beginning of the design process.
The detailed development of construction assemblies should support the translation of the concept into materials and systems. This work is the focus of this course and should be represented as a major component of both the design process and the final presentation documents.

ARCH 4510 is coordinated with ARCH 4327: Technology 5 which is taught during the same semester to the same student cohort. ARCH 4327 focuses on six technology components five of which especially address building integration: site orientation and climate, structure, envelope, materials, and heating/ventilation/air conditioning. These organize its syllabus and also are directly reflected in the requirements for ARCH 4510.

A series of presentations conducted by the ARCH 4510 group's faculty and/or external guests reinforce the main learning outcomes by lecturing on the following topics: 1/Owner's requirements, 2/Site orientation and climate, 3/Structure, 4/Envelope, 5/Materials, 6/Heating, Ventilation, and Air Conditioning.

1.2 M.Arch Program Approach to Building Integration

Faculty invite expert guests for both presentations and for reviews, in order to benefit from the broad knowledge available in the Houston design and engineering community. M.Arch Synthesization studios, which always occur in the Spring of Level III, have engaged with numerous types of projects. Programs goal is always to couple an urgent cultural or social question with the design of a "total" building. For example, in Spring of 2019, students designed a mass timber housing project on the East River in Queens, NY using an ACSA competition brief. Studio faculty engaged a variety of experts working with mass timber for presentations, pinups, and reviews, including Thomas Robinson/Lever Architects (US expert on mass timber buildings), John

Hand/Arup Houston (engineering expert on mass timber) among other technologists, practitioners, visitors and guests.

In Spring 2020, students designed a new Museum of Natural History in Seattle, at the base of Pike Place Market. Local architects were kind enough to introduce us to their work and provide student crits, including Olson Kundig (office visit+pinup) and Robert Hutchison (office visit).

The Spring 2021 M.Arch Synthesization studio project was closer to home, in part due to travel restrictions during the pandemic. Students designed a new multi-use pool and recreation facility for Barton Springs in Austin, a complex hybrid building intended for use by Austin's diverse communities. Guests for presentations and crits included Matt Bunza (MIT), John Hand/Arup (Structural + Mass Timber), Sofia Fonseca (Problem Seeking + Programming), Lisa Osborne (Environmental Engineer), Christine Ten Eyck (Landscape Architecture).

Beyond the Synthesization courses, all of our design studios and tech courses promote ideas of building integration. The Fall Level III course, intended to be broad-based and contextual, nonetheless folds in core ideas of site design, structure and systems integration. In the Fall 2021 6603 studio, for instance, students grappled with flood infrastructure as a part of their projects in New Orleans' Bywater district—working with fundamental ideas about civil engineering, cut and fill, retention/detention, and water resistant structures.

2 CURRENT ASSESSMENTS AND BENCHMARKS—BUILDING INTEGRATION

Our assessment of Building Integration in student work examines the "total project", looking at the incorporation of building systems and technologies, materials, code and life safety, as well as social and perceptual questions such as integration of program, social environments, light, proportion, scale, and space. We evaluate these criteria in a number of formats. Midterm and final reviews, juries, and discussions are primary formats for evaluation, with reviewer feedback, rubrics, and grading as the methods of assessment. Design juries are organized with guests from both the profession and academia (both internal and external reviewers). Guests provide critique and commentary on student projects comprehensively, alongside our internal faculty. Faculty record feedback and report back to students. At the final juries, invited external guests both comment and complete rubrics that are used in a variety of ways.

We currently apply a number of assessment and benchmark criteria in our courses, with ambitions to strengthen and expand our assessment procedures in our evaluation of courses. Below, we explain the current approach to evaluation in the following classes:

In the B.Arch

ARCH 3500 – Architecture Design Studio V
ARCH 3501 – Architecture Design Studio VI
ARCH 4510 – Architecture Design Studio VII

In the M.Arch

ARCH 6A48 – Environmental Tech III
ARCH 6A50 – Construction Technology III
ARCH 6603 – Design Studio III
ARCH 6A49 – Environmental Tech III
ARCH 6A51 – Construction Technology IV
ARCH 6604 – Design Studio IV
ARCH 6361 – Integrated Practice

2.1 Architectural Design Studios Current Assessment and Benchmarks

Architectural Design Studios 4510 (UG), 6603 (G), 6604 (G)

The architectural design studios 4510 (UG) and 6603/6604 (G) are structured around the idea of Building Integration—with the goal to promote well-designed architecture in which all systems are seamlessly correlated. These integrated systems include: landscape/civil/site, structure (from foundation to roof), HVAC, sustainability (including ventilation, solar, and mass), life safety, material systems, facades, and social aspects of design.

Our assessment of student engagement in this area is based on specific completion metrics and key performance indicators, including questions of both design and representation. We evaluate these against industry standards through a number of mechanisms:

- Evaluation rubrics (see below)
- Faculty knowledge of building integration best practices
- Precedents (both local and globally, understood through detailed drawings and images)
- Detailed and collaborative use of material detailing and specification information
- Consultation with local experts (structural, mechanical, civil, environmental engineers; code consultants; others)
- Discussions and collaboration with community stakeholders
- Juries and reviews including external evaluators

As evidence, just in the past year, the graduate ARCH 6603 /6604 studios have engaged in consultations and project reviews with many experts, including: John Hand (Arup—Mass Timber and Sustainable Construction Expert); Lisa Osborne (HVAC, passive solar, and sustainability expert); Clint Willson (environmental engineer and director of the LSU Center for River Studies); Chris Barnes (studio director for Kate Orff/Scape Landcape Architecture New Orleans); Kirby Liu (Head of Design for Lovett Development and Post HTX); Salome Nikuradze (project architect for Post HTX, OMA); Olaf Schmidt (project architect for MFAH Kinder Wing, Steven Holl Architects); in addition to both our invited review guests and many internal faculty experts.

We evaluate our students in a variety of formats. For project assessment and information, as mentioned above, we engage with design professionals as guest lecturers and reviewers, to provide well-rounded feedback from numerous perspectives. We use design juries, pinups, desk crits, and presentations to give comprehensive feedback to our students. Feedback is recorded and submitted back to the students as both a written narrative and in a grading rubric. Students hear the information once in a spoken review, and then receive written notes afterward reinforcing the review comments. We also ask our reviewers to provide written notes after the review as a third point of learning. This feedback is incorporated into our grading rubric. We feel the combination of the rubric as well as narrative explanations and commentary is essential.

We measure each student's ability to make decisions demonstrating both the integration and representation of:

- Building Envelope (with consideration of current industry standards)
- Building Systems (with consideration of industry standards)
- Foundation, Wall, Ceiling, and Roof Assemblies
- Structural systems, from foundation to roof
- Environmental Control Systems
- Life Safety Systems
- Measurable Building Performance Outcomes (using both software and physical models)
- Accessibility
- Codes and Regulations
- Site Integration
- Programming (including pre-design)
- and sustainable and passive solar strategies.

In each case, students compare and contrast their strategies with industry standards, in collaboration with their architect-instructors as well as with external engineers, code consultants, sustainability experts, programming consultants, and others. The feedback from these consultants is then folded into our student evaluations and grading processes.

Assessment of Building Integration in B.Arch Studios

Context.-
Over the academic years of 19/20, 20/21 and 21/22 the B.Arch Program has changed its assessment routines to the ones stablished before. Grad and Undergrad have collaborated and discuss the best mechanism to do a consistent assessment format for both programs. The new assessment method of UGA has introduced two structural changes:

- 1/ Incorporation of the roll of the external reviewers instead of internal.
- 2/ Review of complete contents of strategic studio courses by stablishing a series of rubrics per course.

In each course, the rubrics containing the following questions (see below) will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 (EXPECTED) or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

Initial evaluation points relative to coursework assignments will include:

-ability of making design decisions while demonstrating integration of:

- building envelope in contrast with industry standards,
- building systems in contrast with industry standards,
- assemblies in contrast with industry standards,
- structural systems in contrast with industry standards,
- environmental controls systems in contrast with industry standards,
- life safety systems in contrast with industry standards,
- measurable outcomes of building performance in contrast with industry standards,
- accessibility
- codes and regulations,
- site integration,
- complex programming,
- and sustainable and passive solar strategies,

-ability on the representation of the integration of:

- building envelope,
- building systems,
- assemblies,
- structural,
- environmental controls systems,
- life safety systems,
- accessibility
- codes and regulations,
- site integration,
- complex programming,
- and sustainable and passive solar strategies

For the three courses of ARCH 3500, ARCH 3501 and ARCH 4510 assessments are performed at the Midterm Reviews, the Final Reviews and at the assessment's sessions. Midterm Reviews assessment are conducted internally to anticipate and discuss results in preparation of Final reviews. Midterm and Final Reviews are organized as follows:

- The midterm reviews are assessed by internal reviewers. Reviewers are organized as follows: For the Midterm Review, each course section organize a board of reviewers. The reviewer's board is formed by 3 members: 2 internal faculty, one from another section of the same course, another from a different studio-level or academic area, and 1 upper-level student. Rubrics are filled and returned to the faculty for feedback, assessment and data collection.
- Final Reviews are assessed by external reviewers. A reduced number of sections of each course level (ARCH 3500, ARCH 3501 and ARCH 4510) are selected randomly to be reviewed by external reviewers. The external reviewers are expected to return one fulfilled rubric per student/per section. Data is collected and analyzed.
- Assessment sessions. At the end of each semester starting in last Fall 20, all studio faculty meet with the course faculty and present to the rest of the group one high pass, one average and one low pass in addition to the course premise. Meetings have been recorded and share with faculty for consultation since Fall 20. Discussions after presentations help the group to finalize grades having the overview of all similar sections and upper and lower levels.

This process has been developed over the past two and a half Academic Years. Rubrics has been discussed and progressively implemented in the course schedules but assessment has not been not fully completed as described above for each semester.

Assessment of Building Integration in Arch 3500, ARCH 3501 and ARCH 4510

For the assessment of the student ability to make design decision within architectural projects while demonstrating integration of system the B.Arch program has prepared a series of rubrics from ARCH 3500 to ARCH 4510 that particularly has included the item of Integration as follows:

ARCH 3500.- *Initial demonstration of integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems, and the measurable outcomes of building performance*.

This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Better, Exemplary.
We expect that 80% of our students will earn an average rating of "Expected" or better on the INTEGRATION element on the ARCH 3500 Project. The collected data is introduced in an excel file for analysis and conclusions.

APA F22 ASSESSMENT RUBRIC FOR INTERMEDIATE STUDIO PROJECTS at ARCH 3500 IN THE UHCoAD UNDERGRADUATE PROGRAM

NAAB Criteria for ARCH 3500: PC.2, PC.3, PC.5, PC7, SC.4, SC.5, SC.6

ARCH 3500	Fundamental flaws in the basic selection and configuration of building systems. Inappropriate methods of systems integration; basic errors or incomplete work in the employment of fundamental systems.	Incomplete integration of technical systems with major omnissions. Major conceptual errors in the selection and configuration of building systems. Failure to address sustainable principles of ecological design	Some minor errors and missed opportunities in the integration of technical systems. Some slight misalignment of design intention and system implementation including hardware and material selections	Competent integration of technical constraints; accurate implementation of technical systems, appropriate selection of technology, attention to passive and active systems, responds to sustainable principles	Surpasses the better standards of technical criteria and integrates all technical systems to a high level. Exploits the characteristics of all systems. Embraces net zero energy and/or carbon neutral design.
	UNNACCEPTABLE [1-2]	FAULTING [3-4]	DEVELOPING [5-6]	EXPECTED [7-8]	EXEMPLARY [9-10]
RESEARCH/INNOVATION site conditions, infrastructures, social and cultural context, program, and material opportunities to define the design problem.					
SITE ANALYSIS Site Analysis and relationships between matters such as: Topography, water shed, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.					
APPROPRIATENESS- Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs and demostrate adaptation, and resilience principles in the designed work and adocacy activities					
DESIGN SYNTHESIS, OBJECTIVES AND STRATEGIES research input / research impact into design solution. Ability to make design descisions while demonstrating: synthesis of user requirements, regulatory context, site conditions, and accessible design. Demostrates the values of the design objectives and strategies.					
CREATIVITY- Merges innovation and appropriateness; bridges the real and the ideal; balancing risk and certainty					
TECHNOLOGY- Development, select, configure, proportion, deploy and integrate of stablished or emerging systems. The project shows initial resolution of assemblies of building construction in response to user/project needs and program requirements					

ARCH 3501.- *Partial demonstration of integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems, and the measurable outcomes of building performance.*

This item is to be rated as- Unacceptable, Faulting, Developing, Expected, Better, Exemplary.
We expect that 80% of our students will earn an average rating of "Expected" or better on the INTEGRATION element on the ARCH 3501 Project. The collected data is introduced in an excel file for analysis and conclusions.

APA Sp22 ASSESSMENT RUBRIC FOR INTERMEDIATE STUDIO PROJECTS at ARCH 3501 IN THE UHCoAD UNDERGRADUATE PROGRAM

NAAB Criteria for ARCH 3501- PC.2, PC.3, PC.5, PC.7, SC.3, SC.4, SC.5, SC.6

ARCH 3501					
	UNACCEPTABLE [1-2]	FAULTING [3-4]	DEVELOPING [5-6]	EXPECTED [7-8]	EXEMPLARY [9-10]
RESEARCH/INNOVATION Research of site conditions, infrastructures, social and cultural context, program, and new material technologies to define the design problem. Innovative response.					
SITE ANALYSIS Site analysis and relationships between site elements such as: Topography, water shed, vegetation, built environment, environmental factors. Understanding of the dynamic between built and natural environments.					
APPROPRIATENESS - Responds to context and function, sensitive to urban scales and conditions, establishes a sense of place, achieves programmatic needs, reflects ecological knowledge and responsibility towards climate change mitigation by leveraging ecological, advanced building performance, adaptation and resilience principles in the designed work and advocacy activities					
DESIGN SYNTHESYS CONSIDERED AT MULTIPLE SCALES. research Input / research impact into design solution considering multiple scales. Ability to make design decisions while demonstrating synthesis of user requirements, regulatory context, site conditions, and accessible design.					
REGULATORY CONTEXT _ Clearly achieved and represented: Life safety, land use, laws and regulations.					
TECHNOLOGY/MATERIALITY/CONSTRUCTABILITY - Development, select, configure, proportion, deploy and integrate of stablished or emerging systems.The project shows resolution of assemblies of building construction in response to user/project needs and program requirements and considerations on the measurable environmental impacts.					
CREATIVITY-Merges innovation and appropriateness; bridges the real and the ideal; balancing risk and certainty					
INTEGRATION-Partial demonstration of integration of building envelope systems and assemblies, structural systems, environmental control systems, life safety systems, and the measurable outcomes of building performance.					

Upon the appointment of a new coordinator for ARCH 4510 in advance of the Fall 2020 semester, we implemented a new assessment rubric that is used at midterm and final reviews to capture quantifiable data. We piloted this rubric at the midterm and final reviews of Fall 2020 with no benchmarks in place for that first semester of use.

For our second semester of use during the Fall 2021 semester, we used the same rubric but set quantifiable benchmarks for the outcomes for both the midterm and final reviews. The criteria include the aspects of solar orientation and climate , ,envelope, materials, and integration of mechanical, electrical and plumbing systems. The rubric has ten items, each of which was scored for each (two-student) collaborative design team on a scale from 1 to 5 (1 being the lowest and 5 being the highest). The assessment was provided by faculty and external guest participating in the midterm and final reviews.

Using our assessment tool, we set benchmarks for Fall 2021 to be that that 75% of the class (of all ARCH 4510 students) would receive at least a 60% at midterm review and 75% would receive at least an 80% at final review. We are currently undergoing the analysis of the Fall 2021 data set.

Evidence

Fall 2020 Rubric

Fall 2021 Rubric

1 December 2020

University of Houston Gerald D. Hines College of Architecture and Design
Comprehensive Studio Level Checklist for ARCH4510 Final Reviews
TEAM _____

(please score lowest to highest)	not met 1	2	adequate 3	4	exceptional 5
1/ Solar Orientation/Sustain notes	1	2	3	4	5
2/ Site Plan Accessibility notes	1	2	3	4	5
3/ Life Safety Plan notes	1	2	3	4	5
4/ Structure Integration notes	1	2	3	4	5
5/ Envelope Design notes	1	2	3	4	5
6/ MEP Integration notes	1	2	3	4	5
7/ Materials Selection notes	1	2	3	4	5
Other Notes:					
Design Synthesis/Response notes	1	2	3	4	5
Graphic Representation notes	1	2	3	4	5
Technical Understanding notes	1	2	3	4	5

Checklist for ARCH4510 Final Juries – Fall 2021
TEAM _____

(please score lowest to highest)	not met 1	2	adequate 3	4	exceptional 5	
1/ Solar Orientation/Sustain notes	1	2	3	4	5	
2/ Site Plan Accessibility notes	1	2	3	4	5	
3/ Life Safety Plan notes	1	2	3	4	5	
4/ Structure Integration notes	1	2	3	4	5	
5/ Envelope Design notes	1	2	3	4	5	
6/ MEP Integration notes	1	2	3	4	5	
7/ Materials Selection Notes	1	2	3	4	5	
	__	__	__	__	__	SUBTOTAL __
Other Notes:						
Design Synthesis/Response notes	1	2	3	4	5	
Graphic Representation notes	1	2	3	4	5	
Technical Understanding Notes	1	2	3	4	5	
	__	__	__	__	__	TOTAL __

<u>Assessment of Building Integration in M.Arch Studios</u>

The current assessment rubric in the M.Arch studio courses ARCH 6603 and 6604 is based on a several criteria, with a scale of 1-5 in each area. Each of these elements falls under one of four broad rubric categories: Construction, Craft, Intellectual Clarity, and Completion. These elements are considered in addition to other assessment areas as a part of an overall grade.. The questions in the rubric below are supplemented with specific evaluations of students' approaches to the elements above:

GRADING RUBRIC ARCH 660X — Scale of 1-5

CRAFT		INTELLECTUAL CLARITY		COMPLETION		CONSTRUCTION	
Is the project attentive to questions of scale, space, proportion and atmosphere?		Are the contextual elements used in the project concept clear? (i.e. are history, culture, urban and geophysical context clearly referenced?)		Is the project represented in such a way that it is fully understandable?		Is the construction assembly of the project realistic in terms of architecture industry standards?	
Are digital and physical models well made? Do they indicate space, transparency, opening, solidity, and structure clearly?		Are the parti and massing elements in the project clear? Is there an apparent logic and sequence to how these elements were developed and how they interrelate?		Are the requirements and deliverables for the studio met?		Are building systems (structure, MEP, material etc) represented correctly through drawing, diagrams, and imagery?	
Are renderings and collages clear in their construction? Do they explain the architecture in terms of space, scale, proportion, light, and material?		Do the building systems (structural, atmospheric, material) follow from the project concept?		Do the drawings and images contain everything needed to accurately convey the project?		Are references made to industry standards in terms of construction, codes, and regulations?	
Do diagrams clearly explain how the project works?		Is the project as a whole legible? Do the individual parts, drawings, and images support the larger concept?		Was the student attentive to feedback and to revisions in the design process?		Does the student demonstrate an understanding of how their building would be assembled?	
Are the drawings well-crafted according to architectural standards? Are line weights and other drawing elements clear?		Does the project reference or make use of common understandings of architectural knowledge?		Did the student engage with the instructor and other students in a productive, collaborative way?		Do building systems in the project work together?	

These evaluations are compared to similar work performed in previous semesters and years. In these comparative evaluations, we look at the quality of both integration and representation. Through numerous semesterly meetings with the studio faculty and coordinator, we evaluate the integration of parallel sections as a singular team-taught unit—as well as conversations with

the Director of Graduate Studies and the Graduate Committee. The curriculum is systemically reevaluated through the feedback loop of the micro and macro expectations. We actively seek student feedback on project types, workload, learning goals, and our own instruction. We also use industry standards as a continuous set of benchmarks—provided by both our instructors and our invited guests. Lastly, we examine the general state of discourse at other architecture schools to understand the pedagogical direction of the profession as well as the criteria and benchmarks used both nationally and internationally. We engage in assessment and course correction based on both guest and student feedback every semester.
The end result each semester is a grading matrix that takes these various evaluation methods into account:

ARCH 660X LEVEL II GRADES

	Project 1.1 + 1.2					Project 2 Midterm							Project 2 Final							
STUDENT	Clarity	Craft	Completion	Construction	**TOTAL**	Clarity	Craft	Completion	Construction	**TOTAL**	**MIDTERM TOTAL**	**MIDTERM GRADE**	Clarity	Craft	Completion	Construction	**TOTAL**	**PARTICIPATION, COLLABORATION, LEADERSHIP**	**FINAL TOTAL**	**GRADE**
	3	3	3	2	**2.75**	3	1	2	2	**2.00**	**2.38**	**C+**	3	2	2	2	**2.25**	**3.00**	**2.4**	**C+**
	4	3	3	3	**3.25**	4	3	3	3	**3.25**	**3.25**	**B+**	4	4	4	3	**3.75**	**4.00**	**3.6**	**A-**
	4	4	4	4	**4.00**	4	4	5	4	**4.25**	**4.13**	**A**	5	3	4	4	**4.00**	**3.00**	**4.0**	**A**
	4	4	3	3	**3.50**	3	3	4	3	**3.25**	**3.38**	**B+**	3	3	4	4	**3.50**	**3.00**	**3.4**	**B+**
	4	3	4	4	**3.75**	3	4	4	4	**3.75**	**3.75**	**A-**	5	4	4	3	**4.00**	**4.00**	**3.9**	**A**
	3	2	4		**3.00**	3	3	4	3	**3.25**	**3.13**	**B**	3	3	4	3	**3.25**	**4.00**	**3.3**	**B+**
	4	3	4	3	**3.50**	3	3	4	3	**3.25**	**3.38**	**B+**	3	3	3	3	**3.00**	**2.00**	**3.1**	**B**
	4	3	3	3	**3.25**	3	3	3	3	**3.00**	**3.13**	**B**	3	2	3	3	**2.75**	**2.00**	**2.8**	**B-**
	2	2	1	2	**1.75**	2	2	1	3	**2.00**	**1.88**	**C-**	2	2	1	2	**1.75**	**2.00**	**1.8**	**C-**
	3	3	3	3	**3.00**	3	3	3	3	**3.00**	**3.00**	**B**	4	3	2	3	**3.00**	**3.00**	**3.0**	**B**
	4	4	3	3	**3.50**	4	3	3	3	**3.25**	**3.38**	**B+**	4	3	2	3	**3.00**	**4.00**	**3.3**	**B+**
	3	4	4	4	**3.75**	4	3	4	4	**3.75**	**3.75**	**A-**	5	3	4	3	**3.75**	**3.00**	**3.7**	**A-**
	4	4	4	3	**3.75**	3	4	4	4	**3.75**	**3.75**	**A-**	4	5	4	5	**4.50**	**3.00**	**4.0**	**A**

2.2 Tech Course Assessment and Benchmarks

Tech Courses 6A48, 6A49, 6A50, 6A51

3 EVIDENCE

UHCoAD provides a number of elements to the NAAB visiting team as evidence of Design Synthesis. The most comprehensive evidence our programs provide is complete student projects along with their corresponding course materials, including syllabi, handouts, course reader of M.Arch for all levels, and B.Arch for Foundation Level. The B.Arch and M.Arch goal is always to ensure that the complexities of an integrated building project are presented clearly. Recorded faculty discussions on design, lectures, and presentations of instructors and guests are provided through our digital archive. We are also providing copies of our assessment and grading rubrics.

4 FUTURE DEVELOPMENTS AND BENCHMARKING

WIthin the B. Arch program, the rubric employed in ARCH4510 offered helpful feedback to the faculty and students but proved difficult for guest reviewers to complete while also interactively reviewing the projects and participating in a discussion with the students. In addition, we have found it difficult for the faculty to consistently retrieve the assessments after completion due to the voluntary role of these reviewers.

We have learned that the assessment process needs to be separated from the interactive design review process so that the assessment may receive the focus that it deserves. We plan to hire a team of outside experts to conduct the assessment so that the team members will be accountable for completing the assessment task. For Fall 2022, the assessment rubric will be revised from a 5-point scale to a 10-point scale so that it aligns with assessment tools developed for the 2501, 3500 and 3501 studios. This will create greater consistency with the use of the assessment tools throughout the undergraduate program and foster greater familiarity within the student body and faculty team.

As with all of our courses and programs, we will continue to evolve our Building Integration efforts. We appreciate insights from other programs as well as alternate approaches. Our faculty frequently visit other schools and studios to understand how diverse pedagogical methods work in the context of Building Integration. Locally, we have been in conversation with both Rice University and Texas A&M University regarding their own integration efforts.

We are working to update and strengthen our approaches to building performance—both from the perspective of assessment and design. Our instructors are always evaluating new tools and making use of existing and new resources within the College: the new Advanced Fabrication Lab, the Materials Resource Center, the Keeland Center for Fabrication, and our own Computer Lab.

Moving forward, we would like to better integrate our Tech and Studio offerings. Though they currently work closely together, they would ideally be a seamlessly integrated set of parallel approaches, resonating off one another. We continue to involve outside consultants to understand and evaluate best industry practices in both technical and social areas of design.

In terms of assessment and benchmarking, we are working to refine our mechanisms of feedback for the programs themselves. We need clearer key performance indicators. We plan to expand and refine our rubrics, to evaluate Building Integration more effectively across the curriculum, from studio to tech to practice courses. The rubrics will include consultation with both faculty and external peer reviewers. In each course, the rubrics will be evaluated on a scale of 1-10. (1 being the lowest and 10 being the highest) by faculty and external peer reviewers. The expectation is that 80% of the class would receive a 7.5 or better on average. The data will be collected and analyzed during each course cycle by the faculty, coordinators, directors and administration and based upon the results, updated and modified teaching methods and course content will be responsively deployed to meet, and/or improve the outcome and the course content expectations. This process will happen during the existing coordination meeting held by the Undergraduate Architecture Committee and Graduate Architecture Committee for the B.Arch and M.Arch degrees respectively.

In addition to the list of building integration elements we currently consider above, we would also like to expand Building Integration to provide greater insight into:

- Alternative building energy strategies
- Innovative materials
- Improved building performance design tools (either software or real world)
- Improved performance evaluation tools (either software or real-world)
- Broader integration with diverse experts
- Greater and deeper understanding of both industry standards, and the limits of industry standards

We are currently developing a comprehensive, curriculum-wide approach to these issues. We have engaged the entire school (both faculty and students) in this process.

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4 – Curricular Framework

4.1 – Institutional Accreditation

4.2 Professional Degrees and Curriculum

4.2.1 Professional Studies

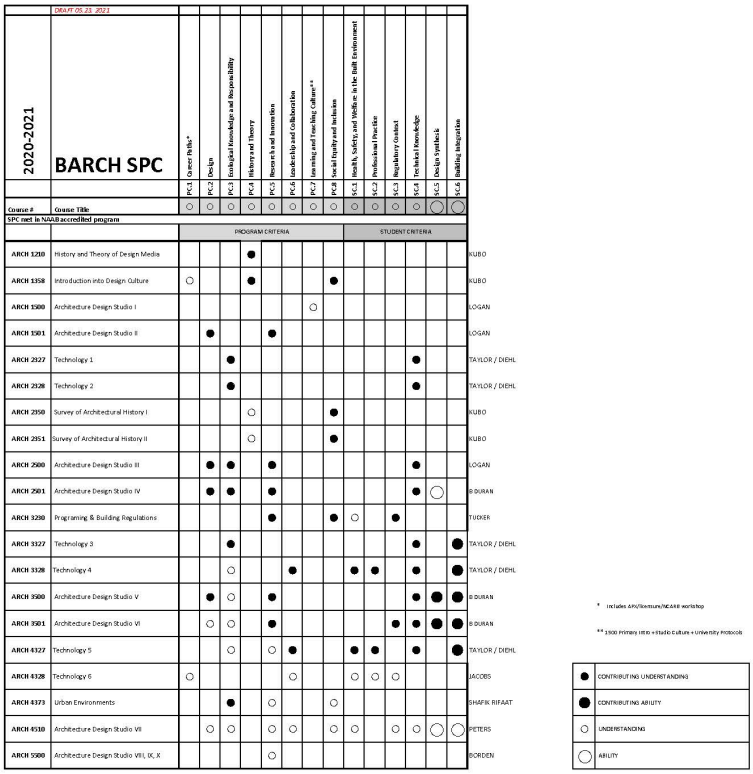
4.2.2 General Studies

4.2.3 Optional Studies

4.2.4 Bachelor of Architecture

Matrix for B.ARCH.

See also Files Folder **4.2.4 Bachelor of Architecture**



DRAFT 05.21.2021

2020-2021	BARCH SPC	PC1 Career Paths*	PC2 Design	PC3 Ecological Knowledge and Responsibility	PC4 History and Theory	PC5 Research and Innovation	PC6 Leadership and Collaboration	PC7 Learning and Teaching Culture**	PC8 Social Equity and Inclusion	SC1 Health, Safety, and Welfare in the Built Environment	SC2 Professional Practice	SC3 Regulatory Context	SC4 Technical Knowledge	SC5 Design Synthesis	SC6 Building Integration	
Course #	Course Title	○	○	○	○	○	○	○	○	○	○	○	○	◯	◯	
SPC met in NAAB accredited program		PROGRAM CRITERIA								STUDENT CRITERIA						
ARCH 1210	History and Theory of Design Media				●											KUBO
ARCH 1358	Introduction into Design Culture	○			●				●							KUBO
ARCH 1500	Architecture Design Studio I							○								LOGAN
ARCH 1501	Architecture Design Studio II		●			●										LOGAN
ARCH 2327	Technology 1			●									●			TAYLOR / DIEHL
ARCH 2328	Technology 2			●									●			TAYLOR / DIEHL
ARCH 2350	Survey of Architectural History I				○				●							KUBO
ARCH 2351	Survey of Architectural History II				○				●							KUBO
ARCH 2500	Architecture Design Studio III		●	●		●							●			LOGAN
ARCH 2501	Architecture Design Studio IV		●	●		●							●	◯		BURAN
ARCH 3230	Programing & Building Regulations					●			●	○		●				TUCKER
ARCH 3327	Technology 3			●									●		●	TAYLOR / DIEHL
ARCH 3328	Technology 4			○			●			●	●		●		●	TAYLOR / DIEHL
ARCH 3500	Architecture Design Studio V		●	○		●							●	●	●	BURAN
ARCH 3501	Architecture Design Studio VI		○	○		●						●	●	●	●	BURAN
ARCH 4327	Technology 5			○		○	●			●	●		●		●	TAYLOR / DIEHL
ARCH 4328	Technology 6	○					○			○	○	○				JACOBS
ARCH 4373	Urban Environments			●		○			○							SHAFIK RIFAAT
ARCH 4510	Architecture Design Studio VII		○	○		○	○		○	○		○	○	◯	◯	PETERS
ARCH 5500	Architecture Design Studio VIII, IX, X					○										BORDEN

* Includes APR/licensure/NCARB workshop

** 1500 Primary Intro + Studio Culture + University Protocols

●	CONTRIBUTING UNDERSTANDING
⬤	CONTRIBUTING ABILITY
○	UNDERSTANDING
◯	ABILITY

4.2.5 Master of Architecture

Matrices for M.ARCH +2 and M.ARCH +3

See also Files Folder **4.2.5 Master of Architecture**

Masters of Architecture +2

Student Performance Criteria

	EDITED 121421														
2020-2021	**MARCH +2 SPC**	PC.1 Career Paths*	PC.2 Design	PC.3 Ecological Knowledge and Responsibility	PC.4 History and Theory	PC.5 Research and Innovation	PC.6 Leadership and Collaboration	PC.7 Learning and Teaching Culture**	PC.8 Social Equity and Inclusion	SC.1 Health, Safety, and Welfare in the Built Environment	SC.2 Professional Practice	SC.3 Regulatory Content	SC.4 Technical Knowledge	SC.5 Design Synthesis	SC.6 Building Integration
		○	○	○	○	○	○	○	○	○	○	○	○	◯	◯
Course #	Course Title	PROGRAM CRITERIA								STUDENT CRITERIA					
ARCH 6301	Visual Studies I														
ARCH 6A48	Environmental Technology III			○						●			○		●
ARCH 6A49	Environmental Technology IV			○		●				●			○		●
ARCH 6A50	Construction Technology III			●							●		○		●
ARCH 6A51	Construction Technology IV			●		●							○		●
ARCH 6357	Contemporary Architectural Theory			●	○				●						
ARCH 6359	Modern Architecture and Urbanism				○	●			●						
ARCH 6360	Practice of Architecture	○					○			●	○	○			
ARCH 6361	Material Representation and Detailing		●								●		●	◯	◯
ARCH 6376	Urban Determinants			●	●	●			○						
ARCH 6393	Research/Master's Project Preparation	●	●			○									
ARCH 6603	Architecture Design Studio III		○	○		○	●	○	○	●		●	○	●	●
ARCH 6604	Architecture Design Studio IV		○	○		○	●		○	○		○	○	◯	◯
ARCH 7600	Architecture Design Studio V														
ARCH 7601	Architecture Design Studio VI														

SPC met in NAAB accredited program

* Includes APX/licensure/NCARB workshop

** 6301 Primary Intro + Studio Culture + University Protocols

●	CONTRIBUTING UNDERSTANDING
●	CONTRIBUTING ABILITY
○	UNDERSTANDING
◯	ABILITY

Masters of Architecture +3

Student Performance Criteria

	EDITED 121421														
2020-2021	**MARCH +3 SPC**	Career Paths*	Design	Ecological Knowledge and Responsibility	History and Theory	Research and Innovation	Leadership and Collaboration	Learning and Teaching Culture**	Social Equity and Inclusion	Health, Safety, and Welfare in the Built Environment	Professional Practice	Regulatory Context	Technical Knowledge	Design Synthesis	Building Integration
		PC.1	PC.2	PC.3	PC.4	PC.5	PC.6	PC.7	PC.8	SC.1	SC.2	SC.3	SC.4	SC.5	SC.6
Course #	Course Title	○	○	○	○	○	○	○	○	○	○	○	○	◯	◯
SPC met in NAAB-accredited program															
		PROGRAM CRITERIA								STUDENT CRITERIA					
ARCH 6301	Visual Studies I														
ARCH 6302	Visual Studies II														
ARCH 6303	Visual Studies III														
ARCH 6304	Visual Studies IV														
ARCH 6A20	Environmental Technology I														
ARCH 6A21	Environmental Technology II														
ARCH 6A48	Environmental Technology III			○						●			○		●
ARCH 6A49	Environmental Technology IV			○		●				●			○		●
ARCH 6A22	Construction Technology I														
ARCH 6A23	Construction Technology II														
ARCH 6A50	Construction Technology III			●							●		○		●
ARCH 6A51	Construction Technology IV			●		●							○		●
ARCH 6340	Survey of Architectural History I														
ARCH 6341	Survey of Architectural History II														
ARCH 6357	Contemporary Architectural Theory			●	○				●						
ARCH 6359	Modern Architecture and Urbanism				○	●			●						
ARCH 6360	Practice of Architecture	○					○			●	○	○			
ARCH 6361	Material Representation and Detailing		●								●		●	◯	◯
ARCH 6376	Urban Determinants			●	●	●			○						
ARCH 6393	Research/Master's Project Preparation	●	●			○									
ARCH 6600	Architecture Design Studio I							○							
ARCH 6601	Architecture Design Studio II														
ARCH 6602	Architecture Design GDBP														
ARCH 6603	Architecture Design Studio III		○	○		○	●		○	●		●	○	●	●
ARCH 6604	Architecture Design Studio IV		○	○		○	●		○	○		○	○	◯	◯
ARCH 7600	Architecture Design Studio V														
ARCH 7601	Architecture Design Studio VI														

* Includes APX/licensure/NCARB workshop

** 6301 Primary Intro + Studio Culture + University Protocols

●	CONTRIBUTING UNDERSTANDING
●	CONTRIBUTING ABILITY
○	UNDERSTANDING
◯	ABILITY

4.2.6 Doctor of Architecture

4.3 Evaluation of Preparatory Education

Access to student files during visit will be provided.

See also separate **Files Folder 4.3 Evaluation of Preparatory Education**

4.3.1

4.3.2

4.3.3

5 – Resources

5.1 – Structure and Governance

5.1.1 Administrative Structure

5.1.2 Governance

5.2 Planning and Assessment

5.2.1

5.2.2 Key performance indicators used by the unit and the institution

See also separate **Files Folder 5.2.2 Key performance indicators used by the unit and the institution**

ARE 5.0 Pass Rates by School

State: Texas

University Name: University of Houston

University Name	Division Name	2017	2018	2019	2020
University of Houston	Construction & Evaluation	50%	50%	55%	53%
	Practice Management	48%	41%	40%	42%
	Programming & Analysis	50%	42%	36%	32%
	Project Development & Docume..	42%	45%	33%	46%
	Project Management	52%	49%	45%	58%
	Project Planning & Design	26%	35%	30%	39%

These pass rates are by division for all candidates (first time and repeat) who took ARE 5.0. *Note: 2020 pass rates include all administrations through December 13, 2020.*

Division	2017	2018	2019	2020
Practice Management	50%	51%	49%	51%
Project Management	59%	62%	63%	63%
Programming & Analysis	53%	53%	52%	50%
Project Planning & Design	50%	46%	42%	45%
Project Development & Documentation	56%	53%	50%	57%
Construction & Evaluation	61%	70%	70%	66%
Number of Candidates Testing	**7,657**	**15,493**	**18,605**	**13,464**

5.2.3 How well the program is progressing toward its mission and stated multiyear objectives.

See also separate Files Folder **5.2.3 How well the program is progressing toward its mission and stated multiyear objectives.**

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State: Texas

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University Name	Division Name	2017	2018	2019	2020
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	Project Development & Docume..	42%	45%	33%	46%
	Project Management	52%	49%	45%	58%
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Division	2017	2018	2019	2020
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Construction & Evaluation	61%	70%	70%	66%
Number of Candidates Testing	**7,657**	**15,493**	**18,605**	**13,464**

The main points of the **2016 - 2021 Strategic Plan**:

OUR VISION

We strive to become a premier college of architecture and design and to produce critical thinkers and global citizens who are skilled in their craft, capable of using advanced technology and methods of industrialized production, respect the environment, understand the power of design to shape many lives, and are equipped to take on leadership roles within their chosen professions.

OUR MISSION

The Gerald D. Hines College of Architecture and Design at the University of Houston remains focused on design as the fundamental activity of its studies since 1956. Building on that focus, the College positions itself to:

Explore solutions to society's myriad challenges through reflection and action with the prospect of advancing the human condition.

Practice with respect for the environment.

Foster innovation through collaboration.

Instill a global view of design and the arts and prepare students to serve as cultural leaders of the 21st century.

Advance our professions through scholarship and research.

Benefit Houston and the greater urban environment through service to the University, our communities, industry, government and the architecture and design professions. *GOALS*

1.Build a local, national, and international value network.
2.Develop our local reputation into a national and global reputation.
3.Develop an integrative model for architectural education.
4.Grow and expand our graduate programs.
5.Attract and retain the best students.
6.Define media, digital fabrication, and digital vocabularies for the College.
7.Develop a robust research agenda for the College.

The College and its programs have moved forward as intended when crafting the Strategic Plan five years ago. Some tenets of the goals have become reality. Other goals are still being worked toward, while some goals had to be adjusted.

The College has been successful in expanding its network through exhibitions, lectures, and guest professors. Exchange programs were established. At the same time, the school's reputation grew due to faculty and student successes: winning competitions, publishing books, exhibiting internationally, and being awarded grants. Developing an integrative model of architectural education is a work in progress. We have taken great strides towards a better interdisciplinary education and course offerings have been expanded and diversified. The Graduate Program has added courses and concentrations to its offerings and recruiting and admission is on a rebound after a dip during the last few years. Attracting and retaining the best students remains a challenge.

The Digital Media Program has been repositioned and expanded, a new Director of Digital Media has been hired, and the new Media and Robotics Lab has been built. Robust research agenda is being developed; cooperation with other colleges and universities increases our chances to attract funding.

The vision and goals established five years ago will be reexamined and redefined this coming year. A new Strategic Plan will be drafted together with faculty and in accordance with the University's vision and plans.

The new UH Strategic Plan, "Together, We Rise; Together, We Soar," has already launched two new initiatives:

Institute for Global Engagement: This new interdisciplinary institute aims to enhance students' international and cultural understanding by embedding learning and research experiences focused on globally relevant topics within all academic programs and disciplines. The CoAD's exchange and study abroad programs will benefit from this new initiative and help to attract the best students, develop a strong international network, and add to the reputation of the CoAD's architecture programs.

The other UH initiative, *Population Health Complex*, is a new interdisciplinary program that will integrate health professions with other disciplines in the University—from engineering and education to the arts and social sciences. The CoAD programs are well situated to become part of this new undertaking, exposing students to complex issues of health care and their architectural implications. It will also help the students, as well as faculty and staff, learn how to achieve a healthy work-life balance.

Achievements, progress, and goals yet to be reached

STRATEGIC PLAN 2016: GOALS AND INITIATIVES

GOAL ONE;

Increase Scholarly Publications

Our record of scholarly publications steadily increased to a peak of 91 publications/journal entries/books per year. In the last two years, we have dropped back to the 70s and 80s/year due to the cancellation of may conference venues.

In the last two years, we have continued to develop MOUs. Our most recent is with the Universidad Politecnica de Madrid.

Even in the pandemic, we launched a major international exhibition in Berlin and the AEDES Gallery on "Houston: City of Refugees," exhibiting in collaboration with world-renown artist Ai Weiwei.

GOAL TWO:

We have managed to be featured in articles in International publications, but we have been less successful in breaking into the national press.

As mentioned above, we received considerable coverage for our "City of Refugees" exhibition in Berline in 2021.

As the pandemic eases, we have more opportunities to participate in national and international conferences again.

We have managed to hire a web-master/videographer for our communications office. We also hired a part-time graduate student from the College of Communications who assists with publications.

GOAL THREE:

The Co-coordinators of Technology have been working on the integration of technology into the studios for several years now. One of them received a grant to attempt to use AR/VR as a mechanism for better understanding of the principles of structures/construction.

We have not yet been totally successful at integrating history, theory, criticism, environmental and social responsibility into the studio culture completely. We have managed to begin an extensive overhaul of our elective offerings to update them and balance them with the needs and ambitions of our curricula and the students' requests for more design media tutorials.

The pandemic has thrust us forward with our desire to re-structure the way we deliver required courses online.

One of the responses to the students' request for more design media tutorials was to develop mini-sessions in media design and sketching which were delivered for the first time this past year.

GOAL FOUR:

We have not been able to develop curriculum in the MS 20th Century Preservation track.

We have begun work on our Ph.D. program as mentioned above, but we have not gotten as far as being able to start the approval process. We hit some bumps in the road when we hired a new Coordinator for History, Theory, and Criticism and he left in the first year for another position in Europe. That set-back has cost us time to search and replace that position. We have been fortunate to have our current coordinator join us, and he has begun to develop this area of our curriculum. We have since become less enamored of the idea of creating a Ph.D. program, so this area is still under consideration.

We have taken first steps in establishing a foundation from which to build the Ph.D. program in Architecture, should we decide to pursue this direction further. We developed an Emerging Scholar fellowship which brings scholars to the college to advance their research with two one-year consecutive fellowship awards. We are on our second Emerging Scholar.

That development of a certificate program with the College of Engineering in Architectural Engineering has not progressed.

We are continuing to build our ID program. We will move forward with a sponsored studio in the spring and we are laying the groundwork for research in the area of Health with a current search.

The MS Urban Design program was given a Presidential Frontier Faculty position to help us expand in this area. We will share the position with Engineering who will have 25% of the FTE.

GOAL FIVE:

We have increased the number of appearances we have at recruitment events. We have also developed our first “Prospectus” which will be published this spring.

The Ambassador program was interrupted by the pandemic, but it is established and continue to be important.

We have expanded our Summer Discovery program to include graduate students. We have also created a separate program for Industrial Design which will launch this summer.

We continue to support students to attend AIAS and IDSA. Students have not yet attended ASID programs for Interior Architecture.

We have increased our scholarships. Happily, we have added two endowed scholarships for graduate students in the last year.

We have not increased our reciprocity agreements.

Our web presence has greatly expanded and developed under the auspices of our Communications Director.

We have not been able to develop a staff position to oversee an internship program.

Our Career Fair has expanded. We hope to host 45 companies this year. We were able to hire a Director of Alumni Affairs which has helped this effort.

GOAL SIX:

We were able to raise money to endow a professorship in Advanced Media Technology and we have completed the first phase of our CRAFT (Construction Robotics and Fabrication Technologies) lab. We hope to complete Phase II this year.

We have also received a Provost"s "Key Initiatives" award which is allowing us to search for a new Director of our Keeland Design Exploration Lab. This award will also support a new Research Liaison Officer and two graduate student positions to help us expand our "Design/Build" program.

GOAL SEVEN:

We have expanded our graduate programs to include our research interests. There are several new concentrations at the graduate level: Urban Design, 20th Century Preservation, Sustainabilty, Computation and Fabrication.

CeSAR continues to expand, receiving its first $1M grant from NSF in 2021.

We have received a Presidential Frontier Faculty grant to hire an additional faculty member in the area of sustainability. This position will be shared 75% Architecture and 25% Engineering. It will allow us to have a critical mass of faculty to be able to deliver the core requirements for a MS degree in Urban Design.

INTITIATIVES:

HUMAN RESOURCES:

Of the eight positions we identified in our last strategic plan, we have been able to hire four of them and we are in a search for a fifth position:

Admin. Asst. Dean's Office

Web Master/Videographer

Staff Writer

Director of UG Architecture

Research Liaison Officer (in process)

HUMAN RESOURCES: FACULTY

At the time of the strategic plan in 2016, we had 23 tenure/tenure-track faculty.

In our strategic plan, we hoped to increase our faculty to 36.

Since then, we have added 5 PE/NTT faculty. While they are not tenured, they are promotion- eligible and they have three year renewable contracts. The PE/NTT faculty are not new to the college, but they have moved from adjunct to full time status.

We are currently searching for four new positions. Two of those positions will be shared 75%/25% with Engineering.

Also, the Director of Graduate Studies was a position that was able to be filled with an external search rather than appointing from within the faculty. That allowed us to add a faculty member.

That brings our College total to **33**

ENROLLMENT:

Our enrollment has grown from 784 in 2016 to 984 in 2021.

RESEARCH:

One of our goals in 2016 was to increase our research revenue. The Provost launched a "50 in 5" campaign in 2018. The idea was to increase your College research by 50% in 5 years. We doubled our revenue in the first year. However, we have a long way to go. We are pretty close to the bottom of the bar graph for total revenue dollars.

FACILITIES:

The completion of the first phase of our new CRAFT Lab has been a major milestone for us. We hope to complete this lab in 2022, adding 9,000 sq. ft. of lab space to our inventory.

CORPORATE AND INSTITUTIONAL PARTNERS:

We continue to develop partnerships. This spring we have a sponsored studio in Industrial Design, and one of our Presidential Frontier Faculty grants comes with additional funds for the development of lab space.

ADVANCEMENT:

We have received an Endowed Professorship in the area of Media Technology.

We have a pledge for $1M for a professorship in Urban Design.

We have not counted the number of scholarships that we have received since 2016, but we have received five **endowed** scholarships in the last year alone.

Our 75th anniversary gala allowed us to raise $450K for our lab and scholarships.

The Dean has managed to raise an average of $900K-$1M/year since 2016.

5.2.4

5.2.5 Ongoing outside input from others, including practitioners.

M.Arch. Programs

In the graduate master project evaluation, we use external reviewers consistently to give feedback. This process and matrix are described in many places in the Addenda such as the PC's and SC'

For juries, the solicited commentary is feedback on individual projects but also on the undertaken exercise (design project, site, premise and methodology) and the faculty offering and leadership through the work. This is witnessed and discussed by faculty and academic leaders and is used as a basis for evaluation and improvement and subsequent offerings. It is used for faculty placement, project evaluation and curricular examination.

The list of external jurors is gathered by the Dean each semester –

For roster see separate **Files Folder 5.2.5 Ongoing outside input from others, including practitioners.**

B.Arch. Program

As much as we have change the APAR template and method the B.Arch has been assessing program by following same process as the Grad. External reviewers have been invited to assess the program. Matrix and process is described several times across narrative. I.e.-

An **Academic Program Assessment Report** (APAR) assesses results every year at both BArch and MArch programs. APAR is based on the discussion feedback and formal assessment of a selected group of external reviewers representing different scale perspectives.

These scales are covered with reviewers from Texas state institutions, (to compare results against standards in peer public institution in the State of Texas), from regional institutions, (to compare results against standards in peer institutions in the Gulf region, and national institutions, (to compare results against standards in institutions that are different in context but similar curricular inquiries).

The **external evaluators v**ary from year to year.
For instance, the rating cycle APAR of 19/20 included:
Professor of Architecture at the College of Architecture at Texas Tech University, Urs Peter Flueckiger, Favrot Associate Professor at Tulane School of Architecture, Kentaro Tsubaki and Assistant Professor of Architecture at Syracuse University, Marcos Parga.

For the APAR 19/20 of the BArch Programs, this group of external evaluators reviewed every single of three different sections of fifth-year projects of ARCH 5500 (the culminating design project level for a UH architecture undergraduate student) following criteria:
Design, Technology, Creativity, Appropriate to context, Craft and Precedent Proficiency.

The Arch 5500 Projects are rated on the following scale:
Exemplary = 10-9, Better = 8-9, Acceptable = 6-7, Developing = 4-6, Faulting = 3-4, Unacceptable = 0-3.
The ratings given by the external reviewers are averaged together to create each student's performance rating in each criterion. Students who earn an average of "Acceptable" on their Design element demonstrate highly skilled abilities in their programmatic organization, contextual response, material form, and development of their Arch 5500 Project.

The results were analyzed by the Undergraduate Director.

Following the same protocols, **MARCH** develops its APAR. Results are projected over a bar table of 20 columns extrapolating the total number of 46 assessed projects to the number of 20.

Within these methods of assessment, **both programs of BARCH and MARCH** observe design holistically, including multiple representational formats from the idea to the material form. Design is central to the way the students' works operate the solution and representation of comprehensive outcome that is displayed in the more detailed documentation. The assessment of the design item lies in the capacity of the project to combine all the intertwined elements from the synthesis of the project problem to the developed project information.

For **ARCH 4510, assessment** is accomplished at two stages of the work:
at midterm with guest juror scoresheets and at final review with similar scoresheets. The scoresheets focus on the integration of environmental performance, site and building accessibility, structural and environmental control technology, material systems, and ecological design with the conceptual design approach. Professional consultants from within the faculty and from the community at large serve as the review panel and provide scored responses to the students' work. The benchmark for 4510 is that 75% of the class would receive at least a 60% at midterm review and at least an 80% at final review. The assessment tool is as follows:

The Assessment Sessions are dedicated time and space for discussing specific course' topics and contents. Sessions are scheduled at the end of each semester and before faculty concludes the grading of their individual

studios. All the sessions are recorded and have been accumulated over the three semesters of Fall 20, Spring 21 and Fall 21 (evidence). After these meetings, recorded materials are shared and distributed for consideration before faculty return to the duty of discussing changes in preparation of the syllabi of followings semester. Over several coordination meetings (no less than three, no more than six) syllabi is discussed and change to recalibrate the pedagogy of the design process, learning outcomes and objectives. This is a complete sequence of curricular examination of the studio sequence.

See also separate **Files Folder 5.2.5 Ongoing outside input from others, including practitioners.**

5.3 Curricular Development

5.3.1 The relationship between course assessment and curricular development, including NAAB program and student criteria.

The relationship between course assessment and curricular development, including NAAB program and student criteria is found in the individual descriptions of each of the SPC criteria.

The faculty/programs have collective conversations about the macro issues of the curriculum relative to the microcosmic courses.

Recent evaluations have included the restructuring of the history curriculum [under Michael Kubo] to integrate theory and criticism in addition to expanding non-western thinking and diversity.

Visual Studies sequence has been developed in the M.Arch programs and a similar approach in the B.Arch [under Andrew Kudless] is being in progress..

In those areas new hires [see Strategic Plan in 5.2.5] will assist in expanding the scope and approach to the topics.

As we take and analyze at the course levels, this aggregate data assembles to be the curricular level data. We do not take data at the two levels. See also each of the SPC criteria responses with the umbrella conversations happening as described in the committees.

For example, in the M.Arch. programs we add more diversity to the topic studios - the merger of 7600 with UG 5500 allows for greater diversity. More of a professional connection is achieved with the development of the Stern Visiting Professorship, visual studies have been enhanced with the development of the visual studies sequence; more digital tools will be available with the development of the new lab and faculty, and more critical intellectual content will be included in the curriculum with the addition of theory and criticism courses.

The B.Arch. program is developed he same way. Instructors teach in both Graduate and Undergraduate course, oftentimes these courses are combined UG/GR classes.

For Meeting Minutes, Agenda, etc. see separate **Files Folder 5.3.1 The relationship between course assessment and curricular development, including NAAB program and student criteria.**

[Including **3 Disciplines Material; UG Committee_Material and Graduate Committee_Material]**

5.3.2

5.4 Human Resources and Human Resource Development

5.4.1 Demonstrate that it balances the workloads of all faculty in a way that promotes student and faculty achievement.

Program Response in APR:
Workload balance for faculty is achieved by weighing course loads against administrative duties and research activities when assigning teaching loads.
The average teaching load is 15 credit hours. The amount of required instructional hours is adjusted when necessary. A course release will be granted for faculty with heavy administrative loads such as directors or coordinators. If a faculty member is engaged in intensive research activities, course release is also available. Studios are taught on a two or three days-per-week schedule allowing faculty to engage in other academic or professional activities on the days they are not teaching.
This system allows faculty to engage in activities benefiting their own as well as their students' success.

Excerpt from the CoAD Faculty Handbook regarding Work Load Policy:

Gerald D. Hines College of Architecture and Design

Faculty Handbook, *Content Revised May 2, 2017*

SECTION 9. ACADEMIC WORKLOAD POLICY

9.1 The normal teaching load per calendar year is 15 credit hours for each tenure and tenure tack faculty member.

9.2 University of Houston policy concerning consulting and outside employment Is as follows: Each faculty member who engages In consulting or other outside employment, Including teaching on a temporary basis at other institutions, during a semester in which the faculty member is assigned teaching duties must ensure that such activities do not Interfere with regularly scheduled classes. Such activities must not require commitments of time averaging more than one day per calendar week (i.e., one day in seven). As approved by the senior vice president for academic affairs and provost, faculty in the College of Architecture and Design is exempt from this limit due to the fact that active faculty participation in professional practice is a critical element of the student design experience and is consistent with the mission and faculty performance

policies of the College ofArchitecture and Design.

See **UH Workload Policy** in separate File **Folder 5.4.1**

5.4.2 Architect Licensing Advisor

Program Response in APR:
Patrick Peters, Architect, Professor of Architecture
Licensed to Practice Architecture in the State of Texas since 2005
NCARB Certificate Holder since 2005
Has been appointed by Dean Oliver as the Architect Licensing Advisor of the UH GDH CoAD

Professor Peters has recently taken over the responsibilities of the Architect Licensing Advisor. He is also the coordinator of the Integrated Architectural Solutions studios, alongside leading the Design Build Program of the Graduate Program. This makes him well positioned to instruct and mentor the students in the AXP program. Prof. Peters, working in collaboration with student Licensing Advisor Kim Saotonglang, implemented a program to provide two "path to licensure" workshops for all students within the programs—one in early fall targeting entering and early year students, and one in late fall targeting existing students. Kim Saotonglang traveled to Miami to attend the NCARB 2021 Licensing Advisors Summit in person while Prof. Peters followed it virtually in Houston.

TRAINING: Due to Covid-19 restrictions, Professor Peters could not attend the NCARB Licensing Advisor Summit in person in August 2021 but did follow it virtually from Houston. He has taken advantage of the NCARB Architect Licensing Advisor Community Resource Library and the Licensing Advisors Daily Digest. In addition to these, he plans to attend the 2022 Southern Conference of NCARB Educators and Practitioners Conference currently being planned for Spring 2022. In preparation for the two "Path to Licensure" workshops that Professor Peters and fourth year student Kim Saotonglang conducted, they attended the "Careers in Architecture and Paths to Licensure" virtual seminar provided to the UH College of Architecture and Design by Martin Smith, AIA, NCARB, LEED GA on February 24, 2021. Lastly, Professor Peters and fourth year student Kim Saotonglang conducted independent research utilizing the NCARB website and other resources. Please see the slide presentations in separate File Folder 5.4.2 as evidence.

ASSESSMENT:

To augment the two Path to Licensure workshops that Professor Peters will conduct each fall, similar content will be integrated and delivered in the Professional Practice class that is required to be completed by each architecture student earning an accredited degree in either of the two programs. The students will be assessed for understanding with an in-class quiz on the content of the presentation. The benchmark will be that 80% of the class earns at least a 75% on the quiz.

See also separate **File Folder 5.4.2Architect Licensing Advisor**

5.4.3 Professional Development

Program Response [in original APR]:
All faculty and staff have opportunities to attend:
ACSA conferences and AIA meetings
College Lecture series that offer CEUs for the TBAE and the AIA
The College's cooperation with other universities and architectural firms offers additional venues for continuing education that benefits the programs.

There are a variety of resources available to faculty (and students):

Computer Lab with around 40 stations equipped with the latest software

Recording Studio for working on lectures or livestreaming

Keeland Design Center with 3-D printing and CNC, metal and woodworking, laser cutting, etc.

Material Resource Collection with reference materials and literature
(Advanced Media Technology Lab when completed)

CDRC with reference materials for community work

Numerous mobile large screen TV/monitors for live conferences and video streaming

The William Jenkins Art and Architecture Library in the building

The college usually reimburses expenses accrued through conference attendance when the faculty member has a paper presentation.

- <u>All faculty and staff have opportunities to attend:</u>
- ACSA conferences and AIA meetings - Attendance data in separate **File Folder 5.4.3**
- College Lecture series that offer CEUs for the TBAE and the AIA – Attendance data in separate **File Folder 5.4.3**
- The College's cooperation with other universities and architectural firms offers additional venues for continuing education that benefits the programs.
- <u>There are a variety of resources available to faculty (and students):</u>
- Computer Lab with around 40 stations equipped with the latest software
- Recording Studio for working on lectures or livestreaming

- Keeland Design Center with 3-D printing and CNC, metal and woodworking, laser cutting, etc. Usage data in separate **File Folder 5.4.3**

- Material Resource Collection with reference materials and literature – Attendance/usage data in separate **File Folder 5.4.3**

- (Advanced Media Technology Lab when completed)

- CDRC with reference materials for community work – see **text below**

- Numerous mobile large screen TV/monitors for live conferences and video streaming

- The William Jenkins Art and Architecture Library in the building . The Library location information is on their website: https://libraries.uh.edu/about/maps-directions/#jenkins - Usage and Attendance data in separate **File Folder 5.4.3**

The **CDRC** has provided background materials, maps, and other resources to a number of studio faculty in the definition of program briefs and sites, particularly when these sites are located in communities where we have worked. This includes providing resources, mapping, and data for the Fifth Ward for Daniel Jacobs' ARCH 5500 studio in Spring of 2021 and for Professor Tom Diehl's studio in Midtown planned for Spring 2022. The CDRC's former Program Manager and GIS specialist, Jose Mario Lopez, provided GIS tutoring and training to Professor Rogers Community Design Workshop course in Spring of 2021 and to Professor Donna Kacmar's studios across three semesters. In total, he provided ArcGIS training for approximately 60 students. The work of the CDRC is often referenced by students in studios and courses across the curriculum. Sharing and referencing the work of the CDRC, which has been informed through the participation of residents and strong partnerships with community leaders and organizations, ensures that faculty and students understand the priorities in the communities where they are developing project proposals. This ensures that the design problems being pursued in studios align with the priorities of communities and further ground the work of the CoAD in the needs of our partner communities and the larger challenges facing communities and the city at large.

For charts, etc. see also separate **File Folder 5.4.3 Professional Development**

5.4.4

5.5 Social Equity, Diversity and Inclusion

5.5.1

5.5.2

5.5.3

5.5.5

5.6 Physical Resources

5.6.1

5.6.2

5.6.3

5.6.4

5.7 Financial Resources

5.8 Information Resources

Links to **NAAB Visit Video Tour of CoAD:**

YOUTUBE:
https://www.youtube.com/watch?v=mcvXlJnbnuc

ORIGINAL FILE:
https://www.dropbox.com/s/n7kzq028dbeet1x/NAAB%20Tour%20Video.mp4?dl=0

For **CoAD Tour Video** see separate **Files Folder 5.8 Information Resources**

6 – Public Information

6.1 Statement on NAAB Accredited Degrees

6.2 Access to NAAB Conditions and Procedures

6.3 Access to Career Development Information

6.4 Public Access to Accreditation Reports and Related Documents

6.5 Admissions and Advising

6.6 Student Financial Information

6.6.1

6.6.2