

# SCHOOL OF ARCHITECTURE

Our Website (<https://arch.vt.edu/>)

## Overview

Architecture enriches our lives by offering us environments that are sensibly compelling, thought provoking, and capable of lifting our spirits. In addition to being beautiful, architecture is, by ancient definition, functional and durable. Like art, architecture is permeated by dualities. It is stable and transitory, measurable and immeasurable, and capable of both being touched and touching us. Like science, architecture involves systematic study. Its methods are iterative, experimental, and rely on intense observation. By intertwining the poetic and practical, architecture is uniquely poised to address the challenges of contemporary life and reflect the culture of the 21st century.

The professional curriculum in architecture requires five years of study for the first professional degree, the Bachelor of Architecture (B. Arch.).

The first professional degree programs at Virginia Tech, the five-year Bachelor of Architecture degree (B. Arch.), the Master of Architecture II (M.Arch.2), and the Master of Architecture III (M.Arch.3) degrees, are fully accredited for the current maximum six-year term of accreditation by the National Architectural Accrediting Board.

All students in the School of Architecture begin their studies in a common first year foundation program. Following the foundation program, students pursue professional studies in the 2-3 and 4-5 programs.

## Foundation Design Program - First Year

Foundation Design Lab is an immersive, interactive learning environment focused on inquiry, experimentation, discovery, and synthesis for students studying architecture. The design lab develops self-reliance and self-critique, opens intellectual horizons, and challenges students to continually expand and deepen their aesthetic judgment and critical understanding. Studies are undertaken in two and three dimensions across multiple scales.

## Professional Program - Second, Third, Fourth, and Fifth Years

The Professional Program employs design theory and processes to study the design of buildings. Students conduct an interactive investigation of architectural space, environmental forces, and building technology. Foundations of discipline-specific knowledge are progressively introduced, discussed, and examined as they contribute to the complex totality of a work of architecture. Students explore natural and cultural forces as they relate to architecture through means of representation specific to the discipline. With architecture at the core, the program examines interdisciplinary sources such as art, science, and philosophy for the purpose of establishing the content the discipline shares with other forms of knowledge.

Concepts in the Professional Program are communicated through both physical drawings and models, as well as through virtual tools and digital production. All coursework seeks to develop the ability to conduct a professional written and verbal discourse. Further emphasis is placed on intellectual discipline, constructive dialogue, assertion of interest, and a self-motivated search for critical issues.

The **second year** is characterized by an increase in the complexity of design exercises to foster a better understanding of the interplay between situation, time and desired spatial definition. Architectural constructs of smaller scales build on knowledge of basic design principles studied in the first year. The laboratory discourse focuses on principal elements of architecture and their compositional and material role in space. Architecture as the art of building is conveyed through the detailed study of exemplary built works.

The **third year** provides for study of fundamental design principles, technical concepts and their applications, including measures of quality in architecture. The instructional content of this year articulates and communicates to students the unique nature of architecture through the study of interrelationships of material, construction systems, site, and building programs. The Architecture III design laboratory guides the student's growing experience with practical design problems and provides order to the gradual exploration and learning of the nature and means of achieving architecture. Associated with Architecture III are lectures, presentations, and workshops intended to challenge students toward sensible integration of necessary systems and legal responsibilities in the design and construction of buildings.

The **fourth year** builds on the increased comprehension of building systems acquired during the third year. On-campus or off-campus, the aim of the various program options is to promote an in-depth understanding of the relationship between architectural idea and physical building form. On-campus students are offered studio courses with various focus topics. Off-campus options include several VT and non-VT Study Abroad Programs, the Extern Program, the Washington-Alexandria Architecture Campus, or the Chicago Studio.

Off-campus programs directed by the Architecture program include:

- *The Europe Study Abroad Travel Program* studies seminal European historic and contemporary architectural works and urban spaces, which are visited and documented with analytical drawings, sketches, and photographs, supplemented by on-site lectures by architects and professionals. Documented research before and after the program leads students to greater depth of understanding of the issues surrounding the architecture.
- *The Steger Center Residency Program*: Each semester, 16 architecture students take part in this program at Virginia Tech's European Steger Center for International Scholarship in Riva San Vitale, Switzerland. An 18th century villa and its gardens on the southern tip of Lake Lugano provide residence and dining facilities for Architecture students, as well as 30 Virginia Tech students from other academic disciplines. Studio work, courses, research, and travel are directed to advance first-hand knowledge of the architecture, geography, and culture of Europe.
- *Boston, Chicago, and other City Lab* options are alternatives to the traditional fourth year Blacksburg-based semester. These off-campus programs integrate design education with interactions between the profession within an urban context.
- *Professional Extern Program* allows students to spend one semester in an approved professional setting and receive up to 12 hours of academic credit. This program provides a valuable link between the academic environment and architectural practices, discipline-related government agencies, and other design offices throughout the world.
- *The Washington-Alexandria Architecture Campus* affords students from the School of Architecture and from related College disciplines the opportunity to study with students and faculty from a national and international consortium of schools in the historic urban context

of Old Town Alexandria. The WAAC complex offers studio space, classrooms, exhibition and review spaces, shops, and computer labs for the students and faculty of the consortium. The University also offers a limited number of apartments for students studying in Alexandria.

In the **fifth year**, students conduct a yearlong advanced study with individual faculty advisors. The in-depth engagement with research, theory, and design is intended to broaden a student's expertise in a particular area within the field of architecture. Fifth-year students are expected to formulate and accomplish advanced high-level work in the form of a terminal project. Working with their advisors, students develop and discuss their research and design progress, and have periodic formal peer reviews throughout the year. Students are required to leave the project documentation of their 5th-year work with the school upon graduation.

The first professional degree programs (B.Arch., M.Arch.2 & M.Arch.3) in architecture are accredited by the National Architectural Accrediting Board (NAAB).

- In the United States, most state registration boards require a degree from an accredited professional degree program as a prerequisite for licensure. The National Architectural Accrediting Board (NAAB), which is the sole agency authorized to accredit U.S. professional degree programs in architecture, recognizes three types of degrees: the Bachelor of Architecture, the Master of Architecture, and the Doctor of Architecture. A program may be granted a 6-year, 3-year, or 2-year term of accreditation, depending on the extent of its conformance with established educational standards.
- Doctor of Architecture and Master of Architecture degree programs may consist of a pre-professional undergraduate degree and a professional graduate degree that, when earned sequentially, constitute an accredited professional education. However, the pre-professional degree is not, by itself, recognized as an accredited degree.
- Next accreditation visit for all Architecture programs: 2027

A four-year, pre-professional degree is not offered at Virginia Tech.

## Program Requirements

### Graduation Requirements

Upon successful completion of program requirements of the foundation level of study and the professional levels of study in architecture and with completion of 160 credit hours of study, a first professional degree of Bachelor of Architecture is awarded.

## Satisfactory Progress

University policy requires that students who are making satisfactory progress toward a degree meet minimum criteria toward the General Education (Curriculum for Liberal Education) (see "Academics (<https://catalog.vt.edu/undergraduate/academic-policies/>)") and toward the degree in Architecture.

Satisfactory progress requirements toward the degree can be found on the University Catalog by visiting <https://catalog.vt.edu/>.

- Architecture Major (<https://catalog.vt.edu/undergraduate/architecture-arts-design/architecture/architecture-barch/>)

**Director - School of Architecture:** J. Bassett

**Chair - Foundation Program:** C. Pritchett

**Chair - Undergraduate Architecture Program:** P. Doan

**Chair - Graduate Program:** D. Dugas

**Professors:** K. Albright, M. Breitschmid, H. de Hahn, R. Dunay, P. Emmons, M. Ermann, J. Jones, S. Piedmont-Palladino, M. Setareh, M. Stamm, and J. Wheeler

**Associate Professors:** J. Bassett, E. Becker, J. Bedford, H. Bryon, P. Doan, D. Dugas, W. Galloway, S. Gartner, R. Gibbons, P. Kelsch, S. Martin, M. McGrath, H. Pittman, H. Schnoedt, G. Tew, S. Tomer, and P. Zellner-Bassett

**Assistant Professors:** A. Algargoosh, L. Borunda Monsivais, G. Cannici, A. Gipe-Lazarou, R. Haghnazar, G. Muñoz-Vera, E. Kslacy, N. King, K. Washco, and C. Williamson

**Collegiate Associate Professor:** R. Pieper, C. Pritchett

**Collegiate Assistant Professor:** C. Vorster

**Associate Professor of Practice:** K. Jones

**Visiting Associate Professors of Practice:** B. Green, and C. Von Wiese

**Visiting Assistant Professors of Practice:** M. Cook, E. Garcia, D. Haney, J. Hernandez, A. Linn, B. Pennell, D. Regan

**Adjunct Instructors:** R. Daniel, D. Dea, T. Green, D. Lever, P. MacDowell, R. Mars, A. Shaver, K. Sullivan, and J. Syvertsen

**Professor Emeritus:** W. Brown, R. Chiang, S. Choudhury, R. Daniel, A.J. Davis, D. Dunay, D. Egger, L. Ferrari, J. Holt, W. Kark, S. Poole, H. Rodriguez-Camilloni, H. Rott, F. Ruiz, R. Schubert, D. Sunshine, S. Thompson, and J. Wang

**Associate Professor Emeritus:** M. Cortes, M. Feuerstein, and D. Jones

**Assistant Professor Emerita:** E. Braaten

## Undergraduate Course Descriptions (ARCH)

### ARCH 1004 - Understanding Community through your Campus (2 credits)

The Virginia Tech campus as both a place and an idea. Explore the physical campus and learn how to recognize its elements. Determine where you are physically, as a community, and as part of an academic tradition. Identification of campus landmarks and navigational exploration. Measure and assess the campus and its spaces and objects, both real and virtual. Place this campus in relation to wider campus ideal and Virginia Tech history. Discussion of custodianship of land by indigenous people and history of black communities in Blacksburg and surrounding areas. Discussion of how and to whom the campus is accessible. Analysis of its buildings, spaces, and branded artifacts in verbal, digital, and drawn representation of the images, forms, and spaces students have observed. Recognition and analysis of both explicit and implicit messages in buildings, objects, and spaces. Come to an understanding of how human-made structures act as stage sets or active frameworks in which we can act out our roles of as members of communities of various kinds and at various scales.

**Instructional Contact Hours:** (2 Lec, 2 Crd)

### ARCH 1015 - Foundation Design Laboratory (6 credits)

Foundation Design Lab is an immersive, interactive learning environment focused on inquiry, experimentation, discovery, and synthesis for students studying architecture, landscape architecture, interior design, and industrial design. The design lab develops self-reliance and self-critique, opens intellectual horizons, and challenges students to continually expand and deepen their aesthetic judgement and critical understanding. Course contact to credit hour structure: Lecture (1H,1C), Lab (6L, 2C), Design Lab/Studio (5L,3C).

**Instructional Contact Hours:** (1 Lec, 11 Lab, 6 Crd)

**ARCH 1016 - Foundation Design Laboratory (6 credits)**

Foundation Design Lab is an immersive, interactive learning environment focused on inquiry, experimentation, discovery, and synthesis for students studying architecture, landscape architecture, interior design, and industrial design. The design lab develops self-reliance and self-critique, opens intellectual horizons, and challenges students to continually expand and deepen their aesthetic judgement and critical understanding. Course contact to credit hour structure: Lecture (1H,1C), Lab (6L, 2C), Design Lab/Studio (5L,3C).

**Instructional Contact Hours:** (1 Lec, 11 Lab, 6 Crd)

**ARCH 1024 - Innovative Design Thinking (3 credits)**

Engages students in learning environment of the design laboratory, which is interactive inquiry, experimentation, discovery, and synthesis. Develops thinking and making skills in 2D and 3D across multiple scales. Advances abilities to solve problems through exploring strategies with viable consequences. Engages students in a series of iterative drawing, and modeling exercises relevant to architecture and design education. ARCH 1024 is restricted to incoming freshmen.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 1034 - Seeing Design: Transforming Observations (3 credits)**

Introduces students to ways of perceiving, and recording the built and natural environment in Southwest Virginia. Introduces students to travel studies as an essential part of their architecture and design education. Transforms students observational skills. Employs photography and sketching as means of documenting findings. Employs screenprinting and digital technologies as a way to transform documentation. Prepares students for an exhibition of their work, including oral presentations. ARCH 1034 is restricted to incoming freshmen.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 1044 - Life in the Built Environment (3 credits)**

Development of the human-made environment has shaped our social relations, culture, and identity. Discussion of how the imposition of built form has served both to define a shared culture and as a means of exclusion and injustice. Study of equity and ethics as evidenced and continued in planning, construction, and public space. Learn how the knowledge of these past structures might shape the future of the built environment in the United States in ways that are more equitable, inclusive, and sustainable.

**Pathway Concept Area(s):** 3 Reasoning in Social Sciences, 7 Identity & Equity in U.S., 11 Intercultural&Global Aware.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Course Crosslist:** SPIA 1044

**ARCH 1115 - Qualifying Design Laboratory (3 credits)**

1115: An immersive, interactive course focused on inquiry, experimentation, discovery, and synthesis. Employs a series of iterative drawing and modeling exercises, at a beginners level, in two and three dimensions across multiple scales. Develops self-reliance and self-critique, which opens intellectual horizons. Challenges expand and deepen aesthetic judgment and critical understanding. Develops fundamental thinking and making skills that advance their abilities to solve problems by exploring strategies toward viable consequences. Restricted to students transferring into the School of Architecture + Design and changing their major to architecture, landscape architecture, interior design, or industrial design. 1116: An immersive, interactive course focused on inquiry, experimentation, discovery, and synthesis. Employs a series of iterative drawing and modeling exercises, at an intermediate level, in two and three dimensions across multiple scales. Develops self-reliance and self-critique, which opens intellectual horizons. Challenges expand and deepen aesthetic judgement and critical understanding. Advances foundational thinking and making skills that develop their abilities to solve problems by exploring strategies toward viable consequences. Restricted to students transferring into the School of Architecture + Design and changing their major to architecture, landscape architecture, interior design, or industrial design.

**Instructional Contact Hours:** (1 Lec, 6 Lab, 3 Crd)

**ARCH 1116 - Qualifying Design Laboratory (3 credits)**

An immersive, interactive course focused on inquiry, experimentation, discovery, and synthesis. Employs a series of iterative drawing and modeling exercises, at an intermediate level, in two and three dimensions across multiple scales. Develops self-reliance and self-critique, which opens intellectual horizons. Challenges expand and deepen aesthetic judgement and critical understanding. Advances foundational thinking and making skills that develop their abilities to solve problems by exploring strategies towards viable consequences. Restricted to students transferring into the School of Architecture + Design and changing their major to architecture, landscape architecture, interior design, or industrial design.

**Prerequisite(s):** ARCH 1115

**Instructional Contact Hours:** (1 Lec, 6 Lab, 3 Crd)

**ARCH 1984 - Special Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 2004 - Architecture and Culture: Buildings, Equity and Climate (3 credits)**

Interdisciplinary and cross-cultural study of architecture and its context - fundamental architectural ideas, how and why buildings are built, how spaces are occupied and by whom, and how external forces (such as social, political, economic, and environmental) inform architecture's construction and occupation. Examine key buildings from cultures around the world through architectural artifacts, texts, and drawings, employing both disciplinary and interdisciplinary perspectives. Analyze how these buildings operated within diverse cultures to investigate the mutual influence between architecture and its context over time. Develop coherent, evidence-based arguments, drawing on insights from both discipline-specific and interdisciplinary approaches. Develop recommendations for inclusive, equitable, and climate-responsive architecture.

**Pathway Concept Area(s):** 2 Critical Thinking Humanities, 7 Identity & Equity in U.S., 11 Intercultural&Global Aware.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 2015 - Architecture II (7 credits)**

Introduction to the theory and practice of architecture. Discipline-specific investigations into how architecture concentrates and conveys natural and cultural influences. Focus on building design as a comprehensive activity balancing numerous concerns including aesthetic, history, materiality, tectonics, and spatial expression. Examination of the relationship between the built and natural environments, including the effects of construction and environmental factors. Qualitative approaches to how architecture contributes to human wellbeing. Identification of relevant areas of interest and modes of inquiry to enrich current work and serve as a basis for self-directed learning. Immersion in the design laboratory ('studio') learning environment. 2015: How architecture concentrates and expresses natural and cultural influences, as well as how it addresses the well-being of individuals and society, through design investigations of varied scales and complexity. Identifying and connecting the fundamentals that comprise the multidimensional wholeness of a work of architecture. Selecting, describing, and analyzing relevant precedents. How architecture and the arts are similar and different, as well as how different fields of knowledge relate to architecture as a cultural and technological production. Discipline-specific modes of communication. 2016: Continued exploration of the dynamic between built and natural environments, including site, environmental forces, and construction impacts; how architecture contributes to human wellbeing. Speculation, development, and communication of architectural proposals. Developing creative source materials by examining a problem from various disciplinary and cultural perspectives. Increasingly complex design work. Hybrid Lecture (2H, 2C), Lab (12L, 4C), Design Lab/Studio (2L, 1C) (2H,14L,7C)

**Prerequisite(s):** ARCH 1016

**Instructional Contact Hours:** (2 Lec, 14 Lab, 7 Crd)

**ARCH 2016 - Architecture II (7 credits)**

Introduction to the theory and practice of architecture. Discipline-specific investigations into how architecture concentrates and conveys natural and cultural influences. Focus on building design as a comprehensive activity balancing numerous concerns including aesthetic, history, materiality, tectonics, and spatial expression. Examination of the relationship between the built and natural environments, including the effects of construction and environmental factors. Qualitative approaches to how architecture contributes to human wellbeing. Identification of relevant areas of interest and modes of inquiry to enrich current work and serve as a basis for self-directed learning. Immersion in the design laboratory ('studio') learning environment. 2015: How architecture concentrates and expresses natural and cultural influences, as well as how it addresses the well-being of individuals and society, through design investigations of varied scales and complexity. Identifying and connecting the fundamentals that comprise the multidimensional wholeness of a work of architecture. Selecting, describing, and analyzing relevant precedents. How architecture and the arts are similar and different, as well as how different fields of knowledge relate to architecture as a cultural and technological production. Discipline-specific modes of communication. 2016: Continued exploration of the dynamic between built and natural environments, including site, environmental forces, and construction impacts; how architecture contributes to human wellbeing. Speculation, development, and communication of architectural proposals. Developing creative source materials by examining a problem from various disciplinary and cultural perspectives. Increasingly complex design work. Hybrid Lecture (2H, 2C), Lab (12L, 4C), Design Lab/Studio (2L, 1C) (2H,14L,7C)

**Prerequisite(s):** ARCH 2015

**Instructional Contact Hours:** (2 Lec, 14 Lab, 7 Crd)

**ARCH 2034 - Art of Building (2 credits)**

Introduction to architecture identifying the fundamental considerations that contribute to the complex totality of a work of architecture. Interrelationships of context, structure, materiality, and technology toward accommodation and advancement of human activities and well-being. Context as preexisting factors and forces of any given site of architecture, not limited to cultural, historical, geographical, and environmental, including topography and climate. Contemporary precedents emphasizing the diversity of cultural practices and values around the globe.

**Prerequisite(s):** ARCH 1016

**Corequisite(s):** ARCH 2015

**Instructional Contact Hours:** (3 Lab, 2 Crd)

**ARCH 2044 - Building Materials (2 credits)**

Introduction to the attributes of materials with which buildings are built such as masonry, reinforced concrete, steel, stone, timber, glass and insulation; introduction of the impact of soil, vegetation, watersheds and other natural conditions on buildings and their material fabrication.

**Prerequisite(s):** ARCH 1015

**Instructional Contact Hours:** (2 Lec, 2 Crd)

**ARCH 2114 - Sustainability by Design (3 credits)**

Design decision-making in complex contexts. Ethical issues underlying design for sustainability. Evaluation of design in systems, products, places, and modes of living using the Framework for Strategic Sustainable Development (FSSD). Historical and cultural underpinnings of design and sustainability.

**Pathway Concept Area(s):** 6D Critique & Prac in Design, 10 Ethical Reasoning

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Course Crosslist:** UAP 2114

**ARCH 2974 - Independent Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 2984 - Special Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 3015 - Architecture III (7 credits)**

Architectural design principles, technical concepts, applications, and measures of quality. Ongoing development of key professional skills such as modes of inquiry, problem structuring, drawing and modeling, workflows, and critique. Site, program, structural, regulatory, and environmental influences addressed in architectural formulations. Development of independent interests, research pursuits, and modes of working. 3015: Various materials and techniques of building design. The technical language of describing designed structures. Human experience, health & wellness, user needs, and regulatory standards in the built environment at multiple scales. Analysis of programmatic and site variables that influence design decisions and resource and environmental stewardship objectives. How fundamental design concepts (idea, movement, structure) and human occupation (context, program, experience) intersect with technical constructive knowledges (assembly, materials, building systems). Subjective measures of quality in design. 3016: Continued studies in materials and techniques of building design. Building assemblies documented in technical drawing, modeling, and writing. Interweaving of fundamental design concepts, human occupation, and technical constructive knowledges. How subjective and measurable (resource, environmental stewardship) criteria impact design decisions. Hybrid Lecture (2H, 2C), Lab (12L, 4C), Design Lab/Studio (2L, 1C) (2H,14L,7C)

**Prerequisite(s):** ARCH 2016

**Corequisite(s):** ARCH 3065

**Instructional Contact Hours:** (2 Lec, 14 Lab, 7 Crd)



**ARCH 3016 - Architecture III (7 credits)**

Architectural design principles, technical concepts, applications, and measures of quality. Ongoing development of key professional skills such as modes of inquiry, problem structuring, drawing and modeling, workflows, and critique. Site, program, structural, regulatory, and environmental influences addressed in architectural formulations. Development of independent interests, research pursuits, and modes of working. 3015: Various materials and techniques of building design. The technical language of describing designed structures. Human experience, health & wellness, user needs, and regulatory standards in the built environment at multiple scales. Analysis of programmatic and site variables that influence design decisions and resource and environmental stewardship objectives. How fundamental design concepts (idea, movement, structure) and human occupation (context, program, experience) intersect with technical constructive knowledges (assembly, materials, building systems). Subjective measures of quality in design. 3016: Continued studies in materials and techniques of building design. Building assemblies documented in technical drawing, modeling, and writing. Interweaving of fundamental design concepts, human occupation, and technical constructive knowledges. How subjective and measurable (resource, environmental stewardship) criteria impact design decisions. Hybrid Lecture (2H, 2C), Lab (12L, 4C), Design Lab/Studio (2L, 1C) (2H, 14L, 7C)

**Prerequisite(s):** ARCH 3015

**Corequisite(s):** ARCH 3066

**Instructional Contact Hours:** (2 Lec, 14 Lab, 7 Crd)

**ARCH 3054 - Building Analysis (2 credits)**

Study of exemplary built works of architecture through analysis of design documents, interviews, and inspection of actual construction. Course is completed as a group project resulting in both an oral presentation and a written document.

**Prerequisite(s):** ARCH 3015

**Corequisite(s):** ARCH 3016, ARCH 3046

**Instructional Contact Hours:** (2 Lec, 2 Crd)

**ARCH 3065 - Building Materials and Assemblies (3 credits)**

Study of what buildings are made of and how buildings are made, in support of architectural design decisions. Attributes of building materials informing their selection and use in buildings. Design and representation of building assemblies, systems, and details, including primary and secondary structural systems, the building envelope, and sub-assemblies, as influenced by formal design ideas, geometry, structure, construction processes, weather resistance, human health and well-being, and environmental impact and sustainability. 3065: Focus on wood, masonry, concrete, and steel construction systems; subsurface conditions and foundations; building codes, life-safety, and accessibility; and basic principles of building envelope systems. 3066: Review of wood, masonry, concrete, and steel construction. Focus on design of building envelope/enclosure wall systems and roofs, including consideration of water resistance, thermal insulation, air infiltration, and vapor control; building cost considerations; and appropriate modes of representation for detailed design decisions.

**Prerequisite(s):** ARCH 2016

**Corequisite(s):** ARCH 3015

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 3066 - Building Materials and Assemblies (3 credits)**

Study of what buildings are made of and how buildings are made, in support of architectural design decisions. Attributes of building materials informing their selection and use in buildings. Design and representation of building assemblies, systems, and details, including primary and secondary structural systems, the building envelope, and sub-assemblies, as influenced by formal design ideas, geometry, structure, construction processes, weather resistance, human health and well-being, and environmental impact and sustainability. 3065: Focus on wood, masonry, concrete, and steel construction systems; subsurface conditions and foundations; building codes, life-safety, and accessibility; and basic principles of building envelope systems. 3066: Review of wood, masonry, concrete, and steel construction. Focus on design of building envelope/enclosure wall systems and roofs, including consideration of water resistance, thermal insulation, air infiltration, and vapor control; building cost considerations; and appropriate modes of representation for detailed design decisions.

**Prerequisite(s):** ARCH 3065

**Corequisite(s):** ARCH 3016, ARCH 3054

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 3115 - Histories of Architecture (3 credits)**

Disciplinary study of architecture across time (pre-history to present) and across continents (Eastern, Western, Northern, and Southern hemispheres). Histories, principles, and factors grounding architecture's expression, form, and methods. Architecture as a cultural production reflective of its social, political, artistic, intellectual, technological, and environmental context. Exploration through artifacts, texts, drawings. ARCH 3115: emphasis on artifacts and architecture between 25000 BCE and 1600 CE; ARCH 3116: includes architectural productions from 1600 CE to present.

**Prerequisite(s):** ARCH 1015

**Pathway Concept Area(s):** 2 Critical Thinking Humanities, 11 Intercultural&Global Aware.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 3116 - Histories of Architecture (3 credits)**

Disciplinary study of architecture across time (pre-history to present) and across continents (Eastern, Western, Northern, and Southern hemispheres). Histories, principles, and factors grounding architecture's expression, form, and methods. Architecture as a cultural production reflective of its social, political, artistic, intellectual, technological, and environmental context. Exploration through artifacts, texts, drawings. ARCH 3115: emphasis on artifacts and architecture between 25000 BCE and 1600 CE; ARCH 3116: includes architectural productions from 1600 CE to present.

**Prerequisite(s):** ARCH 3115

**Pathway Concept Area(s):** 2 Critical Thinking Humanities, 11 Intercultural&Global Aware.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 3204 - Topics Modules in Architecture History & Theory (1 credit)**

Discrete topics in design theory, history, criticism, research methods, and representation. How historic, social, political, technological, and/or economic factors shape the built environment. Historical and contemporary significance of architectural productions within cultural dimensions of human history. How discrete modes of verbal, textual, visual, graphic, or spatial representation influence and reflect understanding relative to architectural form and ideas. May be repeated 2 times with different content for a maximum of 3 credit hours.

**Prerequisite(s):** ARCH 1016

**Instructional Contact Hours:** (1 Lec, 1 Crd)

**Repeatability:** up to 3 credit hours

**ARCH 3214 - Topic Modules in Building Science and Technology (1 credit)**

Focused topics in building technology, systems, materials, construction, assembly and details. Develop scientific expertise that couples quantitative and qualitative dimensions using tools, methods, science, processes of the given field through study, reflection, and application. Utilize empirical knowledge, including building performance, environmental responsibility, and occupant well-being, to advance design excellence. May be repeated 2 times with different content for a maximum of 3 credit hours.

**Prerequisite(s):** ARCH 2015

**Instructional Contact Hours:** (1 Lec, 1 Crd)

**Repeatability:** up to 3 credit hours

**ARCH 3224 - Topics Modules in Architectural Media and Methods (1 credit)**

Properties and uses of media, materials and processes as tools for analysis, documentation, and presentation of the designed environment. Media properties and processes. Selection of workflows. Appropriate use and maintenance of tools. Iterative design and evaluating outcomes. May be repeated 2 times with different content for a maximum of 3 credit hours. Design Lab/Studio (2L, 1C)

**Prerequisite(s):** ARCH 1016

**Instructional Contact Hours:** (2 Lab, 1 Crd)

**Repeatability:** up to 3 credit hours

**ARCH 3234 - Topics Modules in Architecture and Praxis (1 credit)**

Specialized topics in the practice of architecture related to designing, planning, and managing the built environment. Factors that inform and impact both design processes and outcomes, such as environmental justice, professionalism, sustainability, inclusivity, and technology. Established and emerging frameworks of architectural practice in fostering the continuous improvement of the discipline. How architects and architecture can contribute to a variety of academic and professional contexts. Teamwork and leadership. May be repeated 2 times with different content for a maximum 3 credit hours.

**Prerequisite(s):** ARCH 2015

**Instructional Contact Hours:** (1 Lec, 1 Crd)

**Repeatability:** up to 3 credit hours

**ARCH 3304 - Topics in Architecture History & Theory (3 credits)**

Discrete topics in architecture theory, history, criticism, research methods, and representation. How historic, social, political, technological, and economic factors shape the built environment. Historical and contemporary significance of architectural productions within cultural dimensions of human history. The works and ideas of architects, urban planners, historians, theorists, and educators in the context of contemporary architecture. Critical discourse and inquiry. May be repeated 2 times with different content for a total of 9 credit hours.

**Prerequisite(s):** ARCH 3116

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Repeatability:** up to 9 credit hours

**ARCH 3404 - Topics in Building Science and Technology (3 credits)**

Focused topics in building technology, systems, materials, construction, assembly and details. Develop scientific expertise that couples quantitative and qualitative dimensions using empirical and design-based tools, methods, science, processes of the given field through study, reflection, and application. Research methods. Representing and communicating research objectives and findings. Using findings to inform decision-making in design. May be repeated 2 times with different content for a maximum of 9 credit hours.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Repeatability:** up to 9 credit hours

**ARCH 3504 - Topics in Architectural Media and Methods (3 credits)**

Topics in properties and uses of media, materials, and processes as tools for craft, analysis, documentation, and presentation of the designed environment. Media properties, materials and processes. Selection of workflows. Appropriate use and maintenance of tools. Interplay between media properties and workflows. Iterative design and evaluating outcomes. Parallel practices, techniques, and structures of thinking and making. May be repeated 1 time with different content for a maximum of 6 credit hours. Design Lab/Studio (1H, 3L, 3C)

**Prerequisite(s):** ARCH 1016

**Instructional Contact Hours:** (1 Lec, 3 Lab, 3 Crd)

**Repeatability:** up to 6 credit hours

**ARCH 3604 - Topics in Architecture and Praxis (3 credits)**

Specialized topics in the practice of architecture related to designing, planning, and managing the built environment. Develop professional expertise with the knowledge, tools, and processes of the given topic through study, use, and reflection. Existing and emerging theories and frameworks that govern the practice of architecture and its outcomes in the constructed environment. Tools, methods, and practices towards the design of responsive, inclusive, and sustainable works of architecture. Position taken on an individual level within the profession of architecture. May be repeated 1 time with different content for a maximum of 6 credit hours.

**Prerequisite(s):** ARCH 2015

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Repeatability:** up to 6 credit hours

**ARCH 3900 - Bridge Experience (0 credits)**

Application of academic knowledge and skills to in a work-based experience aligned with post-graduation goals using research-based learning processes. Satisfactory completion of work-based experience often in the form of internship, undergraduate research, co-op, or study abroad; self-evaluation; reflection; and showcase of learning. Pre: Departmental approval of 3900 plan.

**Instructional Contact Hours:** (0 Crd)

**ARCH 3954 - Study Abroad (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 3974 - Independent Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 3984 - Special Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 4004 - Architecture IV - Option Lab (7 credits)**

Advanced architecture laboratory with specialized design options, off-campus domestic and study abroad opportunities, technical research, and professional internships. Role of design processes in shaping the built environment in response to multiple factors and across diverse contexts. Immersion in professional or specialized settings to contextualize the student's position in the discipline. Development of student-driven course of action for pursuing ongoing professional interests through engagements with, and contributions to, disciplinary research and discourse. Engagement of new territories of inquiry and representation in design work. Critical professional skills in documentation of technical and discursive dimensions of architectural works. Hybrid Lecture (2H, 2C), Lab (12L, 4C), Design Lab/Studio (2L, 1C) (2H, 14L, 7C)

**Prerequisite(s):** ARCH 3016

**Instructional Contact Hours:** (2 Lec, 14 Lab, 7 Crd)

**ARCH 4014 - Architecture IV - Integrative Design (8 credits)**

Integration of site, program, constructive systems, and regulatory and environmental frameworks to develop conceptually sound and technically feasible architectural works. Application of design research, including precedent analysis and case studies of existing works. Advanced representation techniques including written, graphic, and physical artifacts. Criticism and dialogue. Individual growth in areas of ongoing interest, research, and modes of study in architectural practice. Repeatable one time, Max. 16 cr. Hybrid Lecture (2H, 2C), Lab (15L, 5C), Design Lab/Studio (2L, 1C) (2H, 17L, 8C)

**Prerequisite(s):** ARCH 3016 and ARCH 3054

**Instructional Contact Hours:** (2 Lec, 17 Lab, 8 Crd)

**Repeatability:** up to 16 credit hours

**ARCH 4034 - Building Cities (3 credits)**

Analytical studies in the historical evolution of cities, towns and villages. Comparative studies of urban form in relation to their constructive and imaginative means with an emphasis on modern construction processes. Specific case studies in designing and building cities.

**Corequisite(s):** ARCH 4016

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4044 - Professional Practice in Architecture (3 credits)**

Role and responsibilities of the profession on the environment, public health, and social welfare. Professional ethics. Contributions to policymaking and the building enterprise through leadership, advocacy, and civic engagement. Issues of equity, diversity, and inclusion in the profession, the environments where we practice, and the places we design. Roles, responsibilities and viewpoints of the commissioning, design, and construction ensemble. Contracts, compliance, and risk management. Starting, running, and maintaining a profitable architecture practice to achieve design goals. Methods and technologies for delivering projects. Leadership and professional communication skills, including oral, written, and visual presentations, negotiations and conflict resolution, and interpersonal communication in collaborative teams, interviews, and public meetings. Pursuing licensing, specialization, and/or nontraditional career trajectories. Change and future practice forms.

**Prerequisite(s):** ARCH 3016

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4055 - Environment and Building Systems (3 credits)**

A design oriented study of environmental forces, environmental impacts of the built environment, and related building environmental control, life safety and service systems, with concern for the human psycho-physical impacts of building form and systems performance.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4056 - Environment and Building Systems (3 credits)**

A design oriented study of environmental forces, environmental impacts of the built environment, and related building environmental control, life safety and service systems, with concern for the human psycho-physical impacts of building form and systems performance.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4075 - Building Structures (3 credits)**

Building structures in steel, timber, and reinforced concrete; design of typical components: beams, slabs, columns, beam-columns, connections, and foundations; design of retaining walls; the resistance of buildings to gravity and lateral force action; building stability; floor/roof framing systems; design of simple buildings.

**Prerequisite(s):** ESM 3704

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4076 - Building Structures (3 credits)**

Building structures in steel, timber, and reinforced concrete; design of typical components: beams, slabs, columns, beam-columns, connections, and foundations; design of retaining walls; the resistance of buildings to gravity and lateral force action; building stability; floor/roof framing systems; design of simple buildings.

**Prerequisite(s):** ESM 3704

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4114 - Ideas, Concepts, and Representations of Architecture (3 credits)**

Disciplinary study of ideas, concepts, and representations that have shaped architecture across time (Common Era). Emphasis on ideational constructs and their varied modes of transmission (from textual to oral communications, drawings to images, buildings to models) in relation to the projecting of architecture. Architectural theories and their transmission as cultural productions reflective of societal, ethical, intellectual, environmental, and technological contexts. Presentation and reflection upon architectural discourse itself through written and oral communication.

**Prerequisite(s):** ARCH 3015 and ARCH 3116

**Pathway Concept Area(s):** 1A Discourse Advanced, 10 Ethical Reasoning

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4124 - Advanced Topics in Architecture History & Theory (3 credits)**

Advanced design theory, history, critique, study, and representation. How history, politics, technology, and economics affect architecture and the built environment. Architectural significance. Architectural social, economic, and cultural content. Direct observation, reading, and discourse in architectural criticism. Course may be repeated with different content 2 times for a maximum of 9 credit hours.

**Prerequisite(s):** (ARCH 3204 or ARCH 4114) and ARCH 3304

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Repeatability:** up to 9 credit hours

**ARCH 4144 - Advanced Building Structures I (3 credits)**

Study of long-span building structures. Introduction to geometry, form, and structure of folded and bent surfaces. Study of space grid geometry, close-packing systems, and cellular tensegrity. Approximate design of folded plate structures, single and double curvature shells, single and double layer space frames, suspension roofs, tents, and pneumatic structures.

**Prerequisite(s):** ARCH 4075 and ARCH 4076

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4154 - Advanced Building Structures II (3 credits)**

Study of highrise structures ranging from building slabs and blocks, terraced buildings, and skyscrapers to towers. The complexity of load action including wind, earthquake, and hidden loads. The effect of building height, form, and proportion on force action; considerations of stability and redundancy. Preliminary design of masonry buildings, core structures, suspension buildings, braced skeletons, rigid frames, interstitial systems, staggered truss buildings, tubes and hybrid structures.

**Prerequisite(s):** ARCH 4075 and ARCH 4076

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4224 - Advanced Topics in Building Science and Technology (3 credits)**

Advanced topics in building technology, systems, materials, construction, assembly and details. Develop expertise that couples quantitative and qualitative dimensions using tools, methods, science, processes of the given field through study, reflection, application and dissemination of findings. Norms of communicating findings. Applying research findings to design. May be repeated 1 time with different content for a maximum of 6 credit hours.

**Prerequisite(s):** ARCH 3404

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Repeatability:** up to 6 credit hours

**ARCH 4324 - Advanced Topics in Architectural Media and Methods (3 credits)**

Advanced topics in architectural media, materials, and processes as tools for analysis, documentation, and presentation of the designed environment. Relationship between media characteristics and processes, applied to a wide range of media types and areas of study. Selection of appropriate tools and workflows. Managing and maintaining toolsets and workspaces. Forms of design research and innovation. Iterative design and evaluating outcomes. Creative practice and discourse. May be repeated 1 time with different content for a maximum of 6 credit hours. Design Lab/Studio (1H, 3L, 3C).

**Prerequisite(s):** ARCH 3504

**Instructional Contact Hours:** (1 Lec, 3 Lab, 3 Crd)

**Repeatability:** up to 6 credit hours

**ARCH 4414 - Advanced Environment Building Systems (3 credits)**

Advanced studies of environment and building systems, including development in building systems, urban systems, service systems, construction systems, materials and component systems, psycho-physical considerations, systems analysis, and computer technology. May be repeated for a maximum of 9 credit hours in varied options offered.

**Prerequisite(s):** ARCH 4055 and ARCH 4056

**Instructional Contact Hours:** (2 Lec, 3 Lab, 3 Crd)

**Repeatability:** up to 9 credit hours

**ARCH 4424 - Advanced Topics in Architecture and Praxis (3 credits)**

Advanced topics in the practice of architecture related to designing, planning, and managing the built environment. Innovative knowledge, frameworks, and models for an increasingly just, adaptable, and built environment and profession. Alternative approaches to defining, creating, and value for clients, communities, and employees. May be repeated 1 time with different content for a maximum of 6 credit hours.

**Prerequisite(s):** ARCH 4044

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**Repeatability:** up to 6 credit hours

**ARCH 4434 - Architectural Lighting Design (3 credits)**

Advanced level lecture course focused on lighting. Impact on, need for and measurement of light for humans and the built and natural environments. Selection of color, light sources, equipment and controls. daylight integration. Lighting design, visualization and calculations through hand and digital methods. Evaluation of lighting system energy efficiency and cost. Presentation of lighting design.

**Prerequisite(s):** ARCH 4055 and ARCH 4056

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4514 - Thesis Inquiry (3 credits)**

Student-led, design thesis project research articulated by an aggregated, reflective record of the first semester design work of ARCH 4515-4516 (Architecture V) through an appropriate array of representational means, such as writing, models, images, and drawings. Schematic, critical compilation of ideational and physical process includes critique, evaluation, and presentation of historical, contextual, professional, ethical, and aesthetic considerations; conceptual and theoretical foundations; development of the project's parameters and its design. Course contact to credit hour structure: Lecture (1H, 1C), Lab (3L, 1C), Design Lab/Studio (1.5L, 1C).

**Prerequisite(s):** ARCH 4004 and ARCH 4014

**Corequisite(s):** ARCH 4515

**Pathway Concept Area(s):** 6A Critique & Practice in Arts, 6D Critique & Prac in Design, 10 Ethical Reasoning

**Instructional Contact Hours:** (1 Lec, 3 Lab, 2 Lab, 3 Crd)

**ARCH 4515 - Architecture V (6 credits)**

Advanced design and research to produce an architectural project. Demonstration of a conceptual and professional position through a work of architecture. 4515: Student-led focus on identifying research field; probing professional interests; developing conceptual and project parameters; proposing and evaluating design through varied means of public dialogue, critique, and self-reflection. 4516: Emphasis on resolution of project, formal documentation and presentation of work, communication of conceptual position, and assertion of professional trajectory. Hybrid Lecture (1H,1C), Lab (12L, 4C), Design Lab/Studio (2L, 1C) (1H,14L,6C)

**Prerequisite(s):** ARCH 4004 and ARCH 4014

**Corequisite(s):** ARCH 4514

**Instructional Contact Hours:** (1 Lec, 14 Lab, 6 Crd)

**ARCH 4516 - Architecture V (6 credits)**

Advanced design and research to produce an architectural project. Demonstration of a conceptual and professional position through a work of architecture. 4515: Student-led focus on identifying research field; probing professional interests; developing conceptual and project parameters; proposing and evaluating design through varied means of public dialogue, critique, and self-reflection. 4516: Emphasis on resolution of project, formal documentation and presentation of work, communication of conceptual position, and assertion of professional trajectory. Hybrid Lecture (1H,1C), Lab (12L, 4C), Design Lab/Studio (2L, 1C) (1H,14L,6C)

**Prerequisite(s):** ARCH 4514 and ARCH 4515

**Corequisite(s):** ARCH 4524

**Instructional Contact Hours:** (1 Lec, 14 Lab, 6 Crd)

**ARCH 4524 - Thesis Documentation (3 credits)**

Formal documentation of the architectural design thesis, a terminal design project with a conceptual and professional position in the final, fifth year of the professional degree program. Thesis project, process, concept, research, and ethical position presented through drawings, images, and writings. Preparation of portfolio quality document demonstrating architectural ability within discipline and profession. Course contact to credit hour structure: Lecture (1H, 1C), Lab (3L, 1C), Design Lab/Studio (1.5L, 1C).

**Prerequisite(s):** ARCH 4514 and ARCH 4515

**Corequisite(s):** ARCH 4516

**Pathway Concept Area(s):** 6A Critique & Practice in Arts, 6D Critique & Prac in Design, 10 Ethical Reasoning

**Instructional Contact Hours:** (1 Lec, 5 Lab, 3 Crd)



**ARCH 4705 - Qualifying Design Seminar (3 credits)**

Exploratory overview of selected theories and issues relevant to the design and use of the environment. 4705: Emphasis on history, human behavior, and environmental context as it relates to architecture. 4706: Presentation and discussion of the nature of principal construction materials in relation to building design. Characteristics of primary structural materials: wood, steel, concrete, masonry; environmental control systems; supporting technologies. Not for credit for majors holding a first professional degree in architecture.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4706 - Qualifying Design Seminar (3 credits)**

Exploratory overview of selected theories and issues relevant to the design and use of the environment. 4705: Emphasis on history, human behavior, and environmental context as it relates to architecture. 4706: Presentation and discussion of the nature of principal construction materials in relation to building design. Characteristics of primary structural materials: wood, steel, concrete, masonry; environmental control systems; supporting technologies. Not for credit for majors holding a first professional degree in architecture.

**Instructional Contact Hours:** (3 Lec, 3 Crd)

**ARCH 4715 - Qualifying Design Laboratory (9 credits)**

4715: Design laboratory in which student and faculty teams explore the nature of problems and potentials with which architecture is concerned, and experimentally develop methods and process through which existing contexts are transformed into new conditions. 4716: Provides introduction to basic concepts of building structures, materials, and enclosure systems, and appropriate site and climate responses. Not for credit for majors holding a first professional degree in architecture.

**Instructional Contact Hours:** (3 Lec, 18 Lab, 9 Crd)

**ARCH 4716 - Qualifying Design Laboratory (9 credits)**

4715: Design laboratory in which student and faculty teams explore the nature of problems and potentials with which architecture is concerned, and experimentally develop methods and process through which existing contexts are transformed into new conditions. 4716: Provides introduction to basic concepts of building structures, materials, and enclosure systems, and appropriate site and climate responses. Not for credit for majors holding a first professional degree in architecture.

**Instructional Contact Hours:** (3 Lec, 18 Lab, 9 Crd)

**ARCH 4904 - Professional Studies (1 credit)**

**Instructional Contact Hours:** (1 Lec, 1 Crd)

**ARCH 4954 - Study Abroad (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 4964 - Field Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 4974 - Independent Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 4974H - Independent Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 4984 - Special Study (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 4994 - Undergraduate Research (1-19 credits)**

**Instructional Contact Hours:** Variable credit course

**ARCH 4994H - Undergraduate Research (1-19 credits)**

**Instructional Contact Hours:** Variable credit course