ARCHITECTURE (ARCH)

ARCH 100
Introduction to Architecture
Orientation to contemporary local architecture practice in the context of the history of architectural theory; examination of the changing role of the architect through history; introduction to the formal language and vocabulary of the discipline. Emphasis given to developing written and presentations skills.
Lecture: 2 Lab: 3 Credits: 3
Satisfies: Communications (C)

ARCH 107
Design Communications I: Units and Order
A comparative study of physical and digital media from the immediacy of the hand to the logical rigor of algorithmic design. Organizational systems and mapping strategies are explored as craft is developed across a broad toolkit. Instruction in object-oriented thinking begins an introduction to computer science.
Lecture: 1 Lab: 2 Credits: 3

ARCH 108
Design Communications II: Systems and Assemblages
The full design communication process, from contextual + programmatic analysis to the digital fabrication of a system of parts, will be introduced through a series of related studies. Computationally associative design methodologies will be utilized and continue the computer science introduction.
Prerequisite(s): ARCH 107
Lecture: 1 Lab: 2 Credits: 3

ARCH 113
Architecture Studio I: Elements
Introduction of architecture through the design of architectonic elements – walls, doors, stairs, rooms, etc. Students explore the relationship between the human body and the built environment and learn fundamentals of composition, design process, representation, research, craftsmanship, graphic and verbal communication, and analytical thinking.
Lecture: 0 Lab: 12 Credits: 6
Satisfies: Communications (C)

ARCH 114
Architecture Studio II: Unit
As an extension of the themes of ARCH 113, students explore the synthesis of architectural elements in the design of an integrated architectonic unit comprised of architectural elements. Students are introduced to urban research and further develop their skills of analytical thinking, representation, and design communication.
Prerequisite(s): ARCH 107 and ARCH 113 and ARCH 108*. An asterisk (*) designates a course which may be taken concurrently.
Lecture: 0 Lab: 12 Credits: 6
Satisfies: Communications (C)

ARCH 201
Architecture Studio III: House
Continued development of architectural principles of ARCH 114 through the design of a house in the city and the study of dwelling precedents. Students are introduced to the concepts of programming, urban design, and the technical aspects of construction assemblies and further develop their understanding of design process and their skills in design communication and critical thinking.
Prerequisite(s): ARCH 114 and ARCH 113
Lecture: 0 Lab: 12 Credits: 6

ARCH 202
Architecture Studio IV: Multiple
Continued development of architectural principles of ARCH 201 through research and design of multi-unit housing in the city. Students further their understanding of programming, urban design and the technical aspects of construction assemblies. The study of architectural scale, composition and urban relationships are explored. Development of design process and skills of design communication and critical thinking are furthered.
Prerequisite(s): ARCH 113 and ARCH 201 and ARCH 114
Lecture: 0 Lab: 12 Credits: 6

ARCH 207
Design Communications III: Analysis and Exposure
Introduction to geospatial mapping, data modeling, and data visualization processes for research, analytics, and generative design. Basic data structures, algorithms, and design patterns advance students ability to construct digital tools and communicate complexity.
Prerequisite(s): ARCH 108 and ARCH 107
Lecture: 1 Lab: 2 Credits: 3

ARCH 208
Design Communications IV: Interaction and Immersion
Introduction to immersive, mixed media, and mixed reality experience design and physical interactivity for hybrid media practices for the built environment.
Prerequisite(s): ARCH 107 and ARCH 207 and ARCH 108
Lecture: 1 Lab: 2 Credits: 3

ARCH 230
Systems: Structural Analysis
The course will provide the student with an understanding of basic structural behavior. It will teach students about forces, vectors, equilibrium, statics, free body diagrams, material properties, stress, strain and deformation. It will look at the concepts of loads takedown and tributary area. Part of that discussion will be the concept of diaphragms (flexible vs. rigid) as a way of distributing horizontal loads to the lateral resisting systems.
Prerequisite(s): PHYS 200 or PHYS 123 or (PHYS 211 and PHYS 212)
Lecture: 3 Lab: 0 Credits: 3
Satisfies: Natural Science (N)
ARCH 305  
Architecture Studio V: Hybrid  
Continued development of architectural principles of ARCH 202 through research and design of a project of hybrid program in the city. Students further their understanding of programming, urban design and the technical aspects of construction assemblies. The study of architectural and urban space, site and context, building composition and urban relationships are explored. Development of design process and skills of design communication and critical thinking are furthered.  
Prerequisite(s): ARCH 201 and ARCH 230 and ARCH 202  
Lecture: 0 Lab: 12 Credits: 6

ARCH 306  
Architecture Studio VI: Neighborhood  
Continued development of architectural principles of ARCH 305 through the design of an urban neighborhood project. Students are introduced to urban design and larger scale planning issues and conduct broad-based research into issues impacting larger mixed-use buildings in the city.  
Prerequisite(s): ARCH 201 and ARCH 202 and ARCH 334 and ARCH 230 and ARCH 305  
Lecture: 0 Lab: 12 Credits: 6

ARCH 321  
Contemporary Architecture  
This course investigates the state of contemporary architecture as represented by significant practices, buildings, theories, and criticisms. Themes to be considered include globalization, the role of digital design media, the ethics and aesthetics of sustainability, contemporary urbanism, new approaches to materials and structure, and recent interests in ornament and pattern-making. Current conditions will be related historically to postwar reactions to modernism and contextually to the social and technological shifts of recent decades.  
Prerequisite(s): AAH 120 and AAH 119  
Lecture: 3 Lab: 0 Credits: 3  
Satisfies: Communications (C)

ARCH 331  
Visual Training I  
Aesthetic expression as experience. Exercises in the study of form: proportion and rhythm, texture and color, mass and space. Exercises in visual perception and aesthetic judgment. Isolation and analysis; interdependence and integration of sensuous qualities. Aesthetic unity under restrictive conditions.  
Lecture: 3 Lab: 0 Credits: 3

ARCH 332  
Visual Training II  
Aesthetic expression as experience. Exercises in the study of form: proportion and rhythm, texture and color, mass and space. Exercises in visual perception and aesthetic judgment. Isolation and analysis; interdependence and integration of sensuous qualities. Aesthetic unity under restrictive conditions.  
Prerequisite(s): ARCH 331  
Lecture: 3 Lab: 0 Credits: 3

ARCH 333  
Visual Training III  
Spatial studies with planes and volumes of various materials. Aesthetic expression as experience. Exercises in the study of form: proportion and rhythm, texture and color, mass and space. Exercises in visual perception and aesthetic judgment. Isolation and analysis; interdependence and integration of sensuous qualities. Aesthetic unity under restrictive conditions.  
Prerequisite(s): ARCH 332 and ARCH 331  
Lecture: 3 Lab: 0 Credits: 3

ARCH 334  
Material: Metal  
A comprehensive investigation of steel building design viewed through material properties, structural members, and structural systems. The focus of the class will be the understanding and reduction of complex steel building concepts into understandable components of the detail, the element, and the system. Topics include flexural members, compression members, tension members, lateral and gravity systems, and connections. Current and historical precedents will be presented in case studies and building tours.  
Prerequisite(s): ARCH 230 and (PHYS 123 or PHYS 200)  
Lecture: 3 Lab: 0 Credits: 3  
Satisfies: Natural Science (N)

ARCH 335  
Material: Cementitious  
A comprehensive investigation of concrete building design viewed through material properties, structural members, and structural systems. The focus of the class is the understanding and reduction of complex concrete building concepts into understandable components of the detail, the element, and the system. Topics include flexural members, compression members, tension members, lateral and gravity systems, connections, and detailed technical drawings. Current and historical precedents will be presented in case studies and building tours.  
Prerequisite(s): ARCH 230 and ARCH 334 and (PHYS 123 or PHYS 200)  
Lecture: 3 Lab: 0 Credits: 3  
Satisfies: Natural Science (N)

ARCH 403  
Mechanical and Electrical Building Systems for Architects I  
Selection and design of building support systems: heating, ventilating, air conditioning, water supply, sanitary and storm drainage, power distribution, lighting, communications and vertical transportation. Systems are analyzed for their effect on building form, construction cost and operating efficiency.  
Prerequisite(s): ARCH 201 and ARCH 202  
Lecture: 3 Lab: 0 Credits: 3

ARCH 404  
Mechanical and Electrical Building Systems for Architects II  
Selection and design of building support systems: heating, ventilating, air conditioning, water supply, sanitary and storm drainage, power distribution, lighting, communications, and vertical transportation. Systems are analyzed for their effect on building form, construction cost and operating efficiency.  
Prerequisite(s): ARCH 403  
Lecture: 3 Lab: 0 Credits: 3
ARCH 413
Architectural Practice
Lectures and practical problems dealing with specifications, specification writing, administration of construction, contracts, building law and professional practice.
Lecture: 3 Lab: 0 Credits: 3
Satisfies: Communications (C)

ARCH 414
Professional Practice: Building Case Studies
Case study analysis of buildings, including the design process, building detailing, construction methods, government regulation, owner satisfaction, and post-construction forensics.
Lecture: 3 Lab: 0 Credits: 3
Satisfies: Communications (C)

ARCH 417
Architecture Studio VII: Institution
This course introduces students to technical aspects of building design through a Comprehensive Building Design project focusing on an institutional building in the city. Building on previous design studios, students continue their investigation into urban and cultural research, and are introduced to building systems and concepts of building performance, sustainability and building envelope design. The integration of mechanical, electrical, plumbing systems, structural systems, constructional assemblies, and technology systems is addressed in lectures and studio work, and students are introduced to advanced tools related to building performance and evaluation software.
Prerequisite(s): ARCH 230 and ARCH 404 and ARCH 403 and ARCH 335 and ARCH 334 and ARCH 306
Lecture: 0 Lab: 12 Credits: 6

ARCH 418
Architecture Studio VIII: Institution
This course continues and furthers the student's understanding of the technical aspects of building design through a Comprehensive Building Design project focusing on an institutional building in the city with a complex program. Building on previous design studios, students continue their investigation into urban, programmatic and cultural research, and further their knowledge of building systems and concepts of building performance, sustainability and building envelope design. The integration of mechanical, electrical, plumbing systems, structural systems, constructional assemblies, and technology systems is addressed in lectures and studio work, and students further their understanding of advanced tools related to building performance and evaluation software.
Prerequisite(s): ARCH 230 and ARCH 334 and ARCH 404 and ARCH 403 and ARCH 417 and ARCH 335
Lecture: 0 Lab: 12 Credits: 6

ARCH 419
Architecture Cloud Studio IX: Metropolis
The cloud studio is a research-based design studio focused on investigating the complex forces that shape the built environment and proposing new strategies for urban development. The aim of the studio is to build a commentary and transformative agenda toward the future metropolis and to drive urban and architectural design solutions with the most advanced technologies and critical thought. The studio production is oriented toward the development of new strategies and future urban models with the aim of advancing the knowledge of relationships between urban thinking and materiality, technology, energy, ecology, emerging media, and socio-political and cultural concerns. Strong emphasis is put toward engagement with external parties and agencies to connect the academic environment with the professional practice and to promote cross-disciplinary collaboration. Students will be able to select from a variety of studio topics. Vertical studio integrating advanced BArch, MArch, MLA, MS, and PHD students. Open only to Architecture majors.
Prerequisite(s): ARCH 230 and ARCH 335 and ARCH 334 and ARCH 417 and ARCH 418 and ARCH 403 and ARCH 404
Lecture: 0 Lab: 12 Credits: 6

ARCH 420
Architecture Cloud Studio X: Metropolis
The design-based research studio is a continuation of the ARCH 419 research-based design studio. It is focused on the development of the specific proposals based on the critical findings of ARCH 419. The aim of the studio is to develop formal solutions which address the complexities of modern metropolis and advance disciplinary knowledge at large. The studio production is oriented toward the development of projects in a variety of scales from large-scale master plans, urban designs, and landscape designs to new urban typologies and singular buildings, all of which can address a variety of the issues pertinent to the modern metropolis. The studios are formed in few thematic clusters which complement each other or serve as dialectical opposites. Each studio explores variety of techniques from the parametric design, digital fabrication, model making, and advanced geospatial software to cultural and theoretical discourses. Vertical studio integrating advanced BArch, MArch, MLA, MS, and PHD students. Students will be able to select from a variety of studio topics. Open only to Architecture majors.
Prerequisite(s): ARCH 230 and ARCH 334 and ARCH 335 and ARCH 417 and ARCH 418 and ARCH 403 and ARCH 404
Lecture: 0 Lab: 12 Credits: 6

ARCH 421
Basics of Building Simulation in the Built Environment I
The application of energy conservation methods and renewable energy sources, such as wind power and passive solar systems, will be examined in the development of building energy budgets for a variety of building types.
Lecture: 3 Lab: 0 Credits: 3

ARCH 422
Energy Conscious Design II
The application of energy conservation methods and renewable energy sources, such as wind power and passive solar systems, will be examined in the development of building energy budgets for a variety of building types.
Prerequisite(s): ARCH 421
Lecture: 3 Lab: 0 Credits: 3
ARCH 423
Architectural Programming
Study of the principles of problem definition, problem solving, and decision making in the process of design. Specific research methods are reviewed, including those with computer-aided data collection potential. Coursework includes: identification of client/project requirements and constraints; development of a building/project program; cost analysis; development of relevant design options; and presentation skills and development.
Lecture: 3 Lab: 0 Credits: 3
Satisfies: Communications (C)

ARCH 429
Digital Form Generation
Introduction to the development of algorithmic design methods, a basis for computational thinking. Review programming in CAD systems, programming basics in AutoCAD, extensive creation of 2D and 3D architectural forms, wall patterns, CAD data interrogation, manipulation, and extraction. Introduction to 2D and 3D parametric and rule-based design. Investigation of form creation based on a variety of mathematical relationships including random generation and form generation based on collected data values including images. Also included is a review of CAD database procedures for space planning and bill of quantities. Includes methods for creating models for the purpose of fabrication including CNC and rapid prototyping.
Prerequisite(s): (ARCH 125 and ARCH 226 and ARCH 427) or ARCH 428
Lecture: 2 Lab: 2 Credits: 3

ARCH 431
Visual Training I
This elective comprises several topics. They include traditional media, e.g. sculpture, collage or free-hand drawing, digital prototyping, exhibition design, digital media production, architectural lighting, interior design, etc. The course provides students the opportunity to pursue individual paths in order to synthesize skills acquired in the previous visual training segments of the curriculum.
Prerequisite(s): ARCH 507 with min. grade of C and ARCH 506 with min. grade of C
Lecture: 1 Lab: 2 Credits: 3

ARCH 432
Visual Training II
This elective comprises several topics. They include traditional media, e.g. sculpture, collage or free-hand drawing, digital prototyping, exhibition design, digital media production, architectural lighting, interior design, etc. The course provides students the opportunity to pursue individual paths in order to synthesize skills acquired in the previous visual training segments of the curriculum.
Prerequisite(s): ARCH 507 with min. grade of C and ARCH 506 with min. grade of C
Lecture: 1 Lab: 2 Credits: 3

ARCH 433
Introduction to Digital Fabrication
This course offers a comprehensive exploration of computer-aided fabrication from concept development and modeling through digital file creation and cutting processes. Using CAD/CAM software, laser cutters, CNC mills, and 3D printers, students with a variety of interests can build the elements of detailed models, fabricate a range of finished objects, or even create landscapes incorporating highly articulated surfaces. The course stresses the integration of the complete thought process from concept development to pre-visualization to detailed modeling to fabrication setup and finishing. Students gain a solid understanding of the rapidly developing world of CAD/CAM techniques while acquiring specific long-term skills in software-based modeling and machine-assisted fabrication.
Prerequisite(s): ARCH 208 or ARCH 508
Lecture: 1 Lab: 2 Credits: 3

ARCH 434
Advanced Building Information Modeling Strategies
Students work on research topics related to the intersection of machine learning, artificial intelligence, and building information modeling. We are exploring topics related to neural networks, natural language processing and other advanced computer science topics. The course attempts to ask the question of what should architects and designers be doing with the wealth of data that is defined during the design and construction process.
Prerequisite(s): ARCH 208 or ARCH 508
Lecture: 0 Lab: 3 Credits: 3

ARCH 435
Digital Fabrication
This course explores the design and fabrication of components in contemporary practice. The class will investigate through the design and prototyping of a custom component. Survey of CAD/CAM techniques while acquiring specific long-term skills in software-based modeling and machine-assisted fabrication.
Prerequisite(s): ARCH 208 or ARCH 508
Lecture: 1 Lab: 2 Credits: 3

ARCH 436
Advanced Modeling
This course will focus on 3D modeling of complex geometric components in architecture and design. Concepts explored will concentrate on the advancement of digital design as an iterative process. Various modeling types covered are (1) Explicit Modeling, (2) Nurbs Surface Modeling, (3) Parametric Modeling, and (4) Generative Components and Response Modeling. Output will utilize digital fabrication methods as support of the iterative design process.
Prerequisite(s): ARCH 208 or ARCH 508
Lecture: 0 Lab: 3 Credits: 3
ARCH 438
Design Visualization
This course is an in-depth exploration of new visualization techniques to support and express architectural design through 3D rendering. Topics covered will include 3D modeling, cameras, lighting, material mapping, and rendering output. Presentation concepts covered include storytelling, rendering style, visual mood, and image composition.
Prerequisite(s): ARCH 208 or ARCH 508
Lecture: 1 Lab: 0 Credits: 3

ARCH 440
Pure Form
The concept of pure form resides in the abstract in their ideal state the forms are perfect. Material properties inherently defy perfection and force a set of priorities and decisions that render the proximity of an ideal while providing a sensual experience. The study of the relationship between ideas, form and physical making integral to the production process, through repetition and variation. Production of a cohesive body of investigative work of a single pure form.
Lecture: 3 Lab: 0 Credits: 3

ARCH 441
Collage Making
Collage, the act of bringing together disparate materials and imagery, has the opportunity to explore unknowns, exploit the peculiar, and reveal the uncanny. Collage operates within a contemporary context of mass-production, mass media, and mass consumption. Mash ups, cut ups, power mixing, and sampling are artistic methods of repurposing products made by others. Collage Making explores the iterative process of collection/selection/arrangement and execution. Collages produced will examine architecture in contemporary culture.
Prerequisite(s): ARCH 107 or ARCH 506
Lecture: 3 Lab: 0 Credits: 3

ARCH 445
The Prairie School
Prairie School landscape architects and architects investigated the spatial and material properties of the Midwest which influenced many aspects of design in the twentieth century: ecology, successional and dynamic processes, horizontality, and others. The course specifically addresses the work of Jens Jensen, O.C. Simonds, Frank Lloyd Wright, and Alfred Caldwell within the context of the contemporary discourse on landscape architecture and architecture.
Lecture: 3 Lab: 0 Credits: 3

ARCH 446
History of Landscape Architecture
Survey of the history of landscape design throughout the world, including contemporary projects. The course emphasizes both analytical and holistic approaches to the study of historic designs, highlights the relationship between architecture and landscape, and stresses major concepts that directly influence present day designs. One field trip.
Lecture: 3 Lab: 0 Credits: 3

ARCH 447
Architecture and Furniture
Individually or in small groups, students will design and fabricate furniture as part of a collectively developed master plan. Students explore historic and contemporary furniture design, theory, materials, and fabrication techniques. Lectures and discussions will focus on the relationship between architecture and furniture in its 500-year history, the design process, fabrication technologies and techniques, drawing and modeling as a means of exploration, representation, presentation, and fabrication. Labs will allow students the opportunity to experience in a semester the traditional sequence of master plan, schematic design, design development, construction drawings, fabrication, and use.
Lecture: 1 Lab: 2 Credits: 3

ARCH 448
Furniture Design/Build
This course will introduce students to the use of traditional furniture building techniques including the use of hand and power tools. Students will investigate furniture built of solid wood, composite wood, plastics, and metals and learn to build furniture with a limited number of basic tools and on a budget. A series of exercises will train students to do the physical connection; a series of lectures and presentations will show production and finishing techniques.
Lecture: 1 Lab: 2 Credits: 3

ARCH 454
Contemporary Chicago Architecture: Case Studies
Contemporary architecture and urban design projects in Chicago present an invaluable opportunity to learn about some of the most advanced applications in practice today. By examining significant projects currently underway, this course will investigate project execution, design concepts and the various forces affecting projects’ definition and results. Close scrutiny of all the components and personnel will give a better understanding of the complex synergies, advanced technologies, and adept project teams necessary for successful innovative architecture and urban planning.
Lecture: 3 Lab: 0 Credits: 3

ARCH 456
Topics in Modernism
This class is devoted to the close observation, description, and analysis of works of architecture from 1900 to the present. We will read exemplary texts of architectural criticism and history. Conducted as a seminar, this course studies writings and buildings through research papers, presentations, and other projects.
Lecture: 3 Lab: 0 Credits: 3
Satisfies: Communications (C)
ARCH 460
Integrated Building Delivery Practice/BIM
Architecture has always been a complex interdisciplinary business, where the management of allied professions and industry affiliates is critical to the success of any endeavor of significant scale. The introduction of BIM (Building Information Modeling) is an advance in project delivery tools which should be viewed as a multi-dimensional expansion of the mechanisms of management and accommodation of an ever-broadening range of participants in the organization of a project, allowing the development of a new delivery protocol, IBPD (Integrated Building Project Delivery). BIM is currently recognized as consolidating the basis for a range of functions including drawing, modeling, document management, clash detection, interdisciplinary coordination, estimating, scheduling, constructability review, production modularization, fabrication protocols, and for the analysis of myriad physical and prescriptive demands such as energy consumption, daylighting, code compliance, egress, circulation, and operation scenarios. The breadth of information embedded in a BIM model will require the emergence of facilitating professionals to an extent previously unknown in the practice and the industry. This course explores the state of the profession and the anticipated ramifications. Undergraduate students must be in their fifth year of study.
Lecture: 3 Lab: 0 Credits: 3

ARCH 461
Entrepreneurship and Innovation in Architecture
The course teaches future architects the practical aspects of entrepreneurial small business management, to develop a comprehensive opportunity assessment, and to develop the skills necessary to improve the odds of success. The course will consider strategies to leverage limited resources for maximum effect. The course will also cover small organization and group behavior, performance, leadership, and motivation in small business settings and will focus on the owner/manager as the principal success factor in the context of a small organization. Emphasis is placed on the circumstances and opportunities of the professional practice of architecture: practice as profession, process, organization, business, and evolving models of practice are covered. The course also provides a series of concepts, frameworks, and heuristics that enable the entrepreneur to anticipate and deal with the challenges that accompany growth of an existing business. Cases, exercises, lectures, and speakers are used to focus on choosing opportunities, allocating resources, motivating employees, and maintaining control while not stifling innovation. A key component of the course is how to sustain entrepreneurial thinking in mid-sized ventures as they continue to grow. Undergraduate students must be in their fifth year of study.
Lecture: 3 Lab: 0 Credits: 3

ARCH 462
Planning Law and Land Policy
Since the introduction of basic zoning laws to the numbers and complexity of ordinances attached to any land parcel have proliferated to include those addressing land use, development, density, environmental concerns both on and off site, aesthetic mandates, energy use, quality of life concerns, and infrastructure development, the growing understanding that comprehensive and integrated systems must be managed across property lines to effect sustainable planning and communities will accelerate the number of prescriptive and policy ordinances enforced at the development of a parcel. Many agencies have further created extra-legal linkages between approvals for land development and the provision of social and ideological benefits to the community. The impact on the profession of architecture of the panoply of planning options and governmental goals is the result that the navigation of the system of mandated design determinates is one of the initial and potentially most creative acts in the process of project delivery. Project designers must understand the ramifications and trade-offs inherent in the system, especially in any attempt to achieve the best use of any parcel of land and position the most appropriate built environment. Undergraduate students must be in their fifth year of study.
Lecture: 3 Lab: 0 Credits: 3

ARCH 463
Introduction to Real Estate Finance Fundamentals
The Art of the Deal, with the emphasis on Art, is a term best positioning the financial structuring behind any project. The ability of the project team leader in integrated practice to understand and appreciate the motivations and opportunities inherent in the initiation of the project will be essential in guiding team decisions and maintaining a leadership position. The understanding of the financial underpinnings of a project is of paramount importance to those intending to actually engage the process of initiating and effecting a construction activity. The sources, costs, and sequence of funding, budgeting, cash flow, incentives options, and tax ramifications regarding a project are to be addressed as component knowledge to an understanding of integrated project management. Undergraduate students must be in their fifth year of study.
Lecture: 3 Lab: 0 Credits: 3

ARCH 465
Construction and Project Management
The organization of deliverables from the multiple participants in a project plan, including estimating, quality control, value engineering, scheduling of work, conflict resolution, pay schedules, and project close-out and commissioning are essential to managing a building project. Many of these areas of endeavor are those most directly impacted by the developments addressed in Integrated Building Delivery Practice. This course will solidify the underpinnings and will amplify, where needed, the requisite understanding in these areas of the practice. The development of managerial skills requisite to the practice of this coordination and the basis of developing inter-professional relationships will be stressed throughout the incorporation of the technical methodologies.
Lecture: 3 Lab: 0 Credits: 3
ARCH 466
Entreprenurial Design: Sector Studies/Case Studies
This course will be advanced as an independent study format. Each student will work independently to research a project option, or building type, and document the particular attributes of that case study which require specialized address. Case studies might be a particular business niche such as land sub-divisions, condo conversions, change of use conversions, or build-to-suit options. The studies might pursue particular building types, social initiatives, historic restoration strategies, or even unique construction typologies. Undergraduate students must be in their fifth year of study.
Lecture: 3 Lab: 0 Credits: 3

ARCH 467
Advanced Materials Workshop
This course is designed to involve students with the architectural craft of materials that can be applied to model and prototype construction. Included will be a product project of the student's own choosing.
Lecture: 1 Lab: 2 Credits: 3

ARCH 468
Drawing From Travel
A drawing course that develops the perceptual and technical skills critical to drawing in the field. Particular emphasis will be placed on the freehand travel sketch and its capacity to evoke both the physicality and character of a place. Production of a comprehensive drawn record of travels in the form of a journal/sketchbook is required. Various media will be explored.
Requisite: European Study Program or Paris Program
Lecture: 0 Lab: 6 Credits: 3

ARCH 469
Urban Design in Europe
This seminar course will explore current notions of urbanity as observed in the built environment of some cities in Europe. Projects and discussions will complement the design work undertaken in the architecture design studio. Assignments will focus on documentation and analysis of the various daily patterns and rituals of habitation.
Requisite: European Study Program or Paris Program
Lecture: 3 Lab: 0 Credits: 3

ARCH 470
Image City: Mediation of Space
This seminar surveys the interaction between media and the city from the 19th century to the present. Any consideration of contemporary urban issues must take into account the roles that media and information technologies play in our lives. Every space we encounter or create has to be considered mediated. Course work will include assigned readings, assigned screenings, and creative design problems related to the issues considered in class.
Lecture: 3 Lab: 0 Credits: 3

ARCH 471
Architectural Freehand Rendering
Utilizing site visits, lectures, presentations, and critiques, students will learn freehand sketching, perspective, and conceptual sketching to convey building spatial ideas. Conceptual and schematic analysis of site visits will teach students to represent existing spaces, environments, and buildings as well as various building materials. Students will rely on four media to quicken their drawing skills and visual analysis -- pencil, ink, pastel, and water color.
Lecture: 3 Lab: 0 Credits: 3

ARCH 473
Conflict and Time
This seminar employs comparative studies of other arts, in particular cinema, to illuminate architectural aesthetics and the creative process. It has a dual focus: it undertakes an introduction to film studies through the analysis of films and readings in film theory and aesthetics; at the same time, it will consider architectural concepts and artifacts. The aim is not primarily to study cinema nor to make a definitive conclusion about the congruence or divergence of architecture and cinema. The course intends to cultivate a way of seeing: to illuminate the relations between media, technology, geography, architecture, and ideology.
Lecture: 3 Lab: 0 Credits: 3

ARCH 475
Spatial Stories
This course will examine the spatial story as it appears in diverse media: short fiction, films, everyday discourse, architecture, etc. The coursework will consist of reading and writing assignments as well as the viewing of films and other visual artifacts. The course has two goals: to offer students the opportunity to improve their study and communication skills and to examine the social, cultural, and historical aspects of spatial practices such as architecture.
Lecture: 3 Lab: 0 Credits: 3
Satisfies: Communications (C)

ARCH 476
Developed Surface
This course looks at models as operational and instrumental tools that assist an architect to control both the material and the meaningful. Acting as an advanced seminar and workshop, course sessions will juxtapose speculative model making with seminar discussion. Student work will be reviewed in direct relation to readings and short lectures on historical and theoretical precedents in art, architecture, and urban design. Field research will support speculative mapping and modeling systems. A project to support the studio will reconcile a conceptual interest with a technical one.
(Paris Program)
Lecture: 3 Lab: 0 Credits: 3
ARCH 478
Digital Photography
Equips students with a suite of photographic skills and strategies tailored to their work as architects. Cultivates a discursive practice by developing foundationaltechnical competencies, building awareness of key precedents, and honing a critical perspective for reading photographic images. Topics covered include camera operation, composing, staging, lighting, post-processing, printing, editing, curating, and publishing. Field and studio assignments, case study research work, and conversations with practicing photographers.
Lecture: 3 Lab: 0 Credits: 3

ARCH 480
Materials and Construction
This course provides an overview of basic building materials and assemblies, how they are constructed, and the relationships between them. The objective is to introduce students to the range of material choices available to the designer, new materials and assemblies, and fundamental principles to guide design decisions. The course is organized according to the MasterFormat outline developed by the Construction Specifications Institute. Students will learn standards for writing specifications using a system of numbered categories to organize construction activities, products, and requirements into a standard order. Topics include pre-design issues, sites and foundations, concrete, masonry, metals, wood, plastics, thermal and moisture protection, glass, roofing systems, and conveying equipment.
Lecture: 3 Lab: 0 Credits: 3

ARCH 481
Materiality in Architecture
This course examines the topic of material culture in contemporary architecture, and explores the different approaches, ideas and philosophies associated with aspects of materiality in architecture through the investigation and discussion of case study projects by contemporary architects. Students are introduced to a variety of approaches to the topic since the dawn of the Modern Movement, and explore how different contemporary architects approach the idea of materiality in their work, through their words, thoughts and built work. Thematic topics related to materiality are also presented and discussed, including materiality and landscape, materiality and technology, and materiality and memory. The class format is a lecture presentation by the professor with student discussion. The course is an elective section of the History/Theory sequence.
Lecture: 3 Lab: 0 Credits: 3

ARCH 482
Material: Fibrous
A laboratory and experimental-based class investigation of anisotropic fibrous materials as a building component viewed through historical timber design precedents. Topics include low and high-rise framed construction, cross-laminated timber, CNC fabrication methods composite construction, tensile systems, and wood and paper-based products. Structural analysis will explore material properties and connections of a directionally grained and fibrous medium.
Prerequisite(s): (ARCH 230 and ARCH 334 and ARCH 335) or (ARCH 485 and ARCH 486)
Lecture: 3 Lab: 0 Credits: 3

ARCH 483
Material: Transparent
An exploration of historical and current technology through the work of artists, architects, craftsmen, and engineers in a brittle medium. Topics include wall systems, connections, structural design of all glass structures, and material properties. Sealants, coatings, adhesives, and impact and blast resistant interlayers will also be covered. A lab component will encourage experimentation of columns, beams, and surfaces from glass components.
Prerequisite(s): (ARCH 230 and ARCH 334 and ARCH 335) or (ARCH 485 and ARCH 486)
Lecture: 1 Lab: 2 Credits: 3

ARCH 485
Structures I: Structural Analysis -- The System
Basic understanding of the system involves forces, vectors, equilibrium, statics, supports with free body diagrams, material properties, stress, strain, and deformation (force or temperature). Simple structural systems will be analyzed using simple statics and free body diagrams. The latter part of the course will concentrate on structural typologies. Load paths will be analyzed for several different types, construction materials, and structural systems. Principles of deflection will be presented along with vertical and lateral displacement issues.
Lecture: 3 Lab: 0 Credits: 3

ARCH 486
Structures II: Building Design
A comprehensive investigation of building design viewed through the mechanics of elemental forces. The focus of the class will be the understanding and reduction of complex building concepts into understandable components of the detail, the element, and the system. Topics include lateral resisting components, diaphragms, moment frames, shear walls, and braced frames in historical and current precedents.
Prerequisite(s): ARCH 485
Lecture: 3 Lab: 0 Credits: 3

ARCH 487
Eco Structures
Research seminar giving focus to new technologies, especially complex structures: biotechnic, pneumatic, ultra-tall, composite structures, etc. Students conduct research using literature, data sources, and ideas to prepare imaginative small project interdisciplinary approach to solving problems in the built environment.
Lecture: 3 Lab: 0 Credits: 3

ARCH 488
Long-Span and Special Structures
Introduction of structural systems for long spans and special structures. The structural behavior will be discussed and the required strength and stiffness will be evaluated. Individual projects will be assigned to students to be presented at the end of the course.
Lecture: 3 Lab: 0 Credits: 3
ARCH 489
Structural Systems for Tall Buildings and Long-Span Structures
This course reviews the historical development of the interaction of the structure with architecture and explores future trends and directions. The suitability of different materials and systems will be studied, with emphasis placed on efficiency.
Lecture: 3 Lab: 0 Credits: 3

ARCH 491
Special Problems
Independent study of projects and problems. Students must be advised and have consent of the instructor and approval of the dean.
Credit: Variable

ARCH 495
Technology as Design
Since the development of cast iron as a viable construction material in the mid-1800s, one path of architecture has explored the open-ended possibilities of technology. Integrated within the culture, this determination to use the technology of one’s time as the creative generator of a new evolving architecture becomes the historical precedent of the thesis of this course.
Lecture: 3 Lab: 0 Credits: 3

ARCH 497
Special Projects
Independent study of projects and problems. Students must be advised and have consent of the instructor and approval of the dean.
Credit: Variable

ARCH 498
Academic Training and Research Special Project
Architecture related academic training opportunities (research projects or internships) for students.
Lecture: 0 Lab: 6 Credits: 3

ARCH 500
Global Modernism
During the last one hundred years a number of cultural, economic, and social changes have moved architectural discourse and practice into a global network. This survey course focuses on the rise of new educational, financial, geo-political, professional, and technological scenarios that transformed architecture and urbanism from the end of World War One to the present. Canonical buildings and sites are discussed within the context of global modernism.
Lecture: 3 Lab: 0 Credits: 3

ARCH 501
Contemporary Architecture
This course investigates the state of contemporary architecture as represented by significant practices, buildings, theories, and criticisms. Themes to be considered include globalization, the role of digital design media, the ethics and aesthetics of sustainability, contemporary urbanism, new approaches to materials and structure, and recent interests in ornament and pattern-making. Current conditions will be related historically to postwar reactions to modernism and contextually to the social and technological shifts of recent decades. With a focus on primary readings and building documentation, the course places an emphasis on the great complexity of social, political, intellectual, and technological forces affecting design. Critical reading and writing skills will be emphasized.
Lecture: 3 Lab: 0 Credits: 3

ARCH 502
Advanced Topics in History and Theory I
Intended to build on the knowledge and abilities gained in the foundational architectural history and theory courses. This seminar focuses on advanced topics in history, theory, and criticism. Students select from varying and diverse topics such as urbanism, sustainability, design methodology, aesthetics, ethics and law, history of technology, and architecture in relation to other arts. Seminar may also offer intense focus on particular architects, periods, regions, or movements. Critical reading and writing skills will be emphasized. In addition, the advanced seminar will teach research skills, will expect the students to formulate and pursue original research topics, and will expect oral presentations of these projects. These abilities will be evaluated through in-class presentations and research papers.
Lecture: 3 Lab: 0 Credits: 3

ARCH 503
Advanced Topics in History and Theory II
Intended to build on the knowledge and abilities gained in the foundational architectural history and theory courses. This seminar focuses on advanced topics in history, theory, and criticism. Students select from varying and diverse topics such as urbanism, sustainability, design methodology, aesthetics, ethics and law, history of technology, and architecture in relation to other arts. Seminar may also offer intense focus on particular architects, periods, regions, or movements. Critical reading and writing skills will be emphasized. In addition, the advanced seminar will teach research skills, will expect the students to formulate and pursue original research topics, and will expect oral presentations of these projects. These abilities will be evaluated through in-class presentations and research papers.
Lecture: 3 Lab: 0 Credits: 3

ARCH 505
Urban Ecology
Students will develop a sensitivity to the environment in which architecture is created. Emphasis will be placed on an in-depth exposure to the integration of natural features of site, sustainable components of both natural and man-made systems, and the synergy of ecological design.
Lecture: 3 Lab: 0 Credits: 3
Selection and design of building support systems: heating, ventilation, air conditioning, water supply, sanitary and storm drainage, power distribution, lighting, communications, and vertical transportation. Systems are analyzed for their effect on building form, construction cost, and operating efficiency.

Prerequisite(s): ARCH 513 with min. grade of C
Lecture: 3 Lab: 0 Credits: 3

ARCH 542
Architecture Studio II: House
The second semester of the Master of Architecture focuses on the development of the fundamental aspects of building (space, structure, and materials) which are explored through designing a small house. Students expand their notions of scale and context through the investigation of current issues, historical and contemporary precedents, and the careful analysis and documentation of a specific site within a neighborhood of the city. Through a series of assignments, the studio is guided step by step through an iterative design process that culminates in imagining the home of the future.

Prerequisite(s): ARCH 541 with min. grade of C
Lecture: 0 Lab: 12 Credits: 6
ARCH 543
Architecture Studio III: Neighborhood
Students move beyond the single building and elements that make up the home to consider the spaces between buildings, infrastructural elements, and neighborhoods. More complex sites and programs are introduced through the study of mixed-use buildings with hybrid structures and projects comprised of multiple building elements. Research of neighborhood typologies culminate in an urban design study that becomes the basis for individual building designs. The introduction of sustainable design concepts and material selection increase the students understanding of the building as a whole and are precursor to the comprehensive building design studio. Finally, students explore the architect’s role in the making of a neighborhood and end with a project considering the neighborhood of the future.
Prerequisite(s): ARCH 542 with min. grade of C
Lecture: 0 Lab: 12 Credits: 6

ARCH 544
Architecture Studio IV: Institution
This studio is the last of the four milestones of the curriculum consisting sequentially of Element, House, Neighborhood, and Institution. As a bridge between the concerns of the neighborhood and the metropolitan scale issues to be encountered in the subsequent Cloud Studios, this studio will deal with problems, programs, and contexts that are unique to institutional architecture within the city and will challenge students to create forward-looking strategies for renewed civic and cultural development. Because this studio is the only required comprehensive studio for the Master of Architecture degree program, all students must demonstrate that they are capable of producing a single building project demonstrating the synthesis of ecological planning, programming and code analysis, structure, and building systems. Students will research and produce a building program based on the themes introduced in the studio sections consisting of all necessary code research, context documentation and analysis, building theme research, and logistics research. Project will vary by studio section.
Prerequisite(s): ARCH 543 with min. grade of C
Lecture: 0 Lab: 12 Credits: 6

ARCH 545
Architecture Cloud Studio V: Metropolis
The cloud studio is a research-based design studio focused on investigating the complex forces that shape the built environment and proposing new strategies for urban development. The aim of the studio is to build a commentary and transformative agenda toward the future metropolis and to drive urban and architectural design solutions with the most advanced technologies and critical thought. The studio production is oriented toward the development of new strategies and future urban models with the aim of advancing the knowledge of relationships between urban thinking and materiality, technology, energy, ecology, emerging media, and socio-political and cultural concerns. Strong emphasis is put toward engagement with external parties and agencies to connect the academic environment with the professional practice and to promote cross-disciplinary collaboration. Students will be able to select from a variety of studio topics. Vertical studio integrating advanced BArch, MArch, MS, and PHD students. Open only to Architecture majors.
Prerequisite(s): ARCH 544 with min. grade of C
Lecture: 0 Lab: 12 Credits: 6

ARCH 546
Architecture Cloud Studio VI: Metropolis
The design-based research studio is a continuation of the ARCH 545 research based design studio. It is focused on the development of the specific proposals based on the critical findings of ARCH 545. The aim of the studio is to develop formal solutions which address the complexities of modern metropolis and advance disciplinary knowledge at large. The studio production is oriented toward the development of projects in a variety of scales from large-scale master plans, urban designs, and landscape designs to new urban typologies and singular buildings, all of which can address a variety of the issues pertinent to the modern metropolis. The studios are formed in few thematic clusters which complement each other or serve as dialectical opposites. Each studio explores variety of techniques from parametric design, digital fabrication, model making, and advanced geospatial software to cultural and theoretical discourses. Vertical studio integrating advanced BArch, MArch, MLA, MS, and PHD students. Students will be able to select from varied studio topics. Open only to Architecture majors.
Prerequisite(s): ARCH 545 with min. grade of C
Lecture: 0 Lab: 12 Credits: 6

ARCH 551
Design of Energy-Efficient Buildings I
Design criteria for achieving human performance goals in energy-efficient buildings, criteria for the exterior/interior environment, and criteria for architectural, mechanical, electrical and building system components. Building upon the fall course, various energy-conserving strategies shall be evaluated for achieving cost effective, energy-efficient design of a specific building type.
Lecture: 3 Lab: 0 Credits: 3

ARCH 552
Design of Energy-Efficient Buildings II
Design criteria for achieving human performance goals in energy-efficient buildings, criteria for the exterior/interior environment, and criteria for architectural, mechanical, electrical and building system components. Building upon the fall course, various energy-conserving strategies shall be evaluated for achieving cost effective, energy-efficient design of a specific building type.
Lecture: 3 Lab: 0 Credits: 3

ARCH 553
High-Rise Building Technology I
The course consists of presentations by specialists in the various technologies of high rise buildings including planning, financing, code reinforcement, materials, architecture, engineering, project management, construction, building management services, safety, and maintenance.
Lecture: 3 Lab: 0 Credits: 3

ARCH 554
High-Rise Building Technology II
The course consists of presentations by specialists in the various technologies of high rise buildings including planning, financing, code reinforcement, materials, architecture, engineering, project management, construction, building management services, safety, and maintenance.
Lecture: 3 Lab: 0 Credits: 3
ARCH 560
**Integrated Building Delivery Practice/BIM**
Architecture has always been a complex interdisciplinary business, where the management of allied professions and industry affiliates is critical to the success of any endeavor of significant scale. The introduction of BIM (Building Information Modeling) is an advance in project delivery tools which should be viewed as a multi-dimensional expansion of the mechanisms of management and accommodation of an ever-broadening range of participants in the organization of a project, allowing the development of a new delivery protocol, IBPD (Integrated Building Project Delivery). BIM is currently recognized as consolidating the basis for a range of functions including drawing, modeling, document management, clash detection, interdisciplinary coordination, estimating, scheduling, constructability review, production modularization, fabrication protocols, and for the analysis of myriad physical and proscriptive demands such as energy consumption, daylighting, code compliance, egress, circulation, and operation scenarios. The breadth of information embedded in a BIM model will require the emergence of facilitating professionals to an extent previously unknown in the practice and the industry. This course explores the state of the profession and the anticipated ramifications.
*Lecture: 3 Lab: 0 Credits: 3*

ARCH 561
**Entrepreneurship and Innovation in Architecture**
The course teaches future architects the practical aspects of entrepreneurial small business management, to develop a comprehensive opportunity assessment and to develop the skills necessary to improve the odds of success. The course will consider strategies to leverage limited resources for maximum effect. The course will also cover small organization and group behavior, performance, leadership, and motivation in small business settings and will focus on the owner/manager as the principal success factor in the context of a small organization. Emphasis is placed on the circumstances and opportunities of the professional practice of architecture: practice as profession, process, organization, business, and evolving models of practice are covered. The course also provides a series of concepts, frameworks, and heuristics that enable the entrepreneur to anticipate and deal with the challenges that accompany growth of an existing business. Cases, exercises, lectures, and speakers are used to focus on choosing opportunities, allocating resources, motivating employees, and maintaining control while not stifling innovation. A key component of the course is how to sustain entrepreneurial thinking in mid-sized ventures as they continue to grow.
*Lecture: 3 Lab: 0 Credits: 3*

ARCH 562
**Planning Law and Land Policy**
Since the introduction of basic zoning laws to the numbers and complexity of ordinances attached to any land parcel have proliferated to include those addressing land use, development, density, environmental concerns both on and off site, aesthetic mandates, energy use, quality of life concerns, and infrastructure development, the growing understanding that comprehensive and integrated systems must be managed across property lines to effect sustainable planning and communities will accelerate the number of prescriptive and policy ordinances enforced at the development of a parcel. Many agencies have further created extra-legal linkages between approvals for land development and the provision of social and ideological benefits to the community. The impact on the profession of architecture of the panoply of planning options and governmental goals is the result that the navigation of the system of mandated design determinates is one of the initial and potentially most creative acts in the process of project delivery. Project designers must understand the ramifications and trade-offs inherent in the system, especially in any attempt to achieve the best use of any parcel of land and position the most appropriate built environment.
*Lecture: 3 Lab: 0 Credits: 3*

ARCH 563
**Introduction to Real Estate Finance Fundamentals**
The Art of the Deal, with the emphasis on Art, is a term best positioning the financial structuring behind any project. The ability of the project team leader in integrated practice to understand and appreciate the motivations and opportunities inherent in the initiation of the project will be essential in guiding team decisions and maintaining a leadership position. The understanding of the financial underpinnings of a project is of paramount importance to those intending to actually engage the process of initiating and effecting a construction activity. The sources, costs, and sequence of funding, budgeting, cash flow, incentives options, and tax ramifications regarding a project are to be addressed as component knowledge to an understanding of integrated project management.
*Lecture: 3 Lab: 0 Credits: 3*
ARCH 564
Comprehensive Opportunity Assessment and Entrepreneurship Development Project/Practicum
Two options are available to the student for the acquisition and assimilation of the breadth of knowledge required to bring project ideas to fruition. The Comprehensive Development Project is a capstone effort which will demonstrate project concept, planning resolution, land acquisition strategies, estimating, scheduling, financial pro-forma, and value capture intents. The practicum would entail employment at a vetted office engaged in the actual process of project assembly. A position requiring a minimum of 20 hours per week, prior review and approval of the work plan, and submittal of documentation of the work undertaken would be required for this scenario. The ultimate objective is to provide a roadmap of the interaction between the architect-entrepreneur, market opportunities, and integrated building delivery practices which facilitate the development of student skills necessary to compete in a rapidly changing socio-economic environment. This course is designed to help students learn and use tools and frameworks to create, implement, and update a strategic plan to shape the future and guide an entrepreneurial organization on its path to success. This course will entail collaboration with real world organizations including city agencies, community development corporations, IIT Department of Community Affairs, or private developers.
Lecture: 6 Lab: 0 Credits: 6

ARCH 565
Construction and Project Management
The organization of deliverables from the multiple participants in a project plan, including estimating, quality control, value engineering, scheduling of work, conflict resolution, pay schedules, and project close-out and commissioning are essential to managing a building project. Many of these areas of endeavor are those most directly impacted by the developments addressed in Integrated Building Delivery Practice. This course will solidify the underpinnings and will amplify, where needed, the requisite understanding in these areas of the practice. The development of managerial skills requisite to the practice of this coordination and the basis of developing inter-professional relationships will be stressed throughout the incorporation of the technical methodologies.
Lecture: 3 Lab: 0 Credits: 3

ARCH 566
Entrepreneurial Design: Sector Studies/Case Studies
This course will be advanced as an independent study format. Each student will work independently to research a project option, or building type, and document the particular attributes of that case study which require specialized address. Case studies might be a particular business niche, such as land sub-divisions, condo conversions, change of use conversions, or build-to-suit options. The studies might pursue particular building types, social initiatives, historic restoration strategies, or even unique construction typologies.
Lecture: 3 Lab: 0 Credits: 3

ARCH 568
Architectural Practice
Lectures and practical problems dealing with specifications, specification writing, administration of construction, contracts, building law, and professional practice.
Lecture: 3 Lab: 0 Credits: 3

ARCH 569
Good Design and Good Business: The Fundamentals
From our very own experience, architects with ambitious design agendas have a tendency to focus on design at the expense of paying attention to and designing their businesses. Awareness of a more integrated and balanced approach is essential for young architects as they navigate a rapidly changing world, and will help them develop tools and skills to implement, at varying scales, their ideas of a better metropolis. Specifically, the seminar will touch upon such topics as decision making, communication and presentation skills, multidisciplinary collaboration, persuasion and negotiation, and professional advocacy. Pedagogically, the seminar will consist of lectures, case studies, readings, and practice assignments.
Lecture: 3 Lab: 0 Credits: 3

ARCH 570
Talking TALL I
Talking TALL I will fully examine the physical, environmental, and social sustainability implications of tall buildings at human, architectural, and urban scales in order to offer students extensive and in-depth knowledge and resources to investigate tall buildings and future cities. The aspects of TALL buildings covered in this course include their design principles, technologies, appropriateness to context, energy consumption, life-cycle considerations, natural ventilation, vertical greenery, facades, new typologies, and more. The aspects of TALL cities covered include an analysis of vertical urbanism vs. suburban sprawl, transportation and infrastructure implications, quality of life for residents in tall urban environments, etc., -- all ultimately with a view to a discourse on what should constitute a holistic vision of "sustainable vertical urbanism."
Lecture: 3 Lab: 0 Credits: 3

ARCH 571
Talking TALL II
Talking TALL II will fully examine the physical, environmental, and social sustainability implications of tall buildings at human, architectural, and urban scales in order to offer students extensive and in-depth knowledge and resources to investigate tall buildings and future cities. The aspects of TALL buildings covered in this course include their design principles, technologies, appropriateness to context, energy consumption, life-cycle considerations, natural ventilation, vertical greenery, facades, new typologies, and more. The aspects of TALL cities covered include an analysis of vertical urbanism vs. suburban sprawl, transportation and infrastructure implications, quality of life for residents in tall urban environments, etc., -- all ultimately with a view to a discourse on what should constitute a holistic vision of "sustainable vertical urbanism."
While Talking TALL I focuses mostly at the urban scale, Talking TALL II focuses more on the detailed building/technological scale.
Lecture: 3 Lab: 0 Credits: 3
ARCH 588
Thesis Preparation Seminar
The Master of Science in Architecture program positions its investigations in the liminal space between emerging forms of urbanization and existing concepts of architecture, landscape, and cities. Our goal is to develop new and better models for shaping socially, culturally, and ecologically sustainable environments. Thesis preparation seminars are conducted on thesis development with a thesis statement outlining an area of study or a problem that has consequences for contemporary architectural production at-large. Thesis development is parallel and complementary with the research-based design cloud studio ARCH 545 with Master of Science students focusing on the social and cultural aspect of research-based design developments. The seminar will focus on developing a bibliography, case studies of referential projects and built structures, and advanced research methods specifically tailored to the research interests of each student. Regular oral presentations will focus on development of thesis content, the use of media and rhetoric, and the didactic nature of disciplinary architectural communication. Open only to Architecture majors. Lecture: 0 Lab: 3 Credits: 3

ARCH 589
Pre-Thesis Seminar
The Master of Science program seeks to be synthetic and inter-disciplinary in its approach. In contrast to an increasingly compartmentalized design profession divided into disparate realms of expertise, the program endeavors to sharpen critical thinking through collaborative and experimental working processes. Thesis development is parallel and complementary with the design-based research cloud studio ARCH 546. The focus is on design-based research work understood both as an intellectual problem of exploring the relationship between design and theory for knowledge production and as a practical problem of the way that design research can affect architectural practice. The seminar is focused on the general development of thesis work specifically generating an overall thesis structure and opening chapters. By the end of the semester, a thesis advisory committee with a thesis chairman and two additional faculty members is assigned to each thesis student. Open only to Architecture majors. Lecture: 0 Lab: 3 Credits: 3

ARCH 590
Specialized Research and Thesis Development
Each thesis project must demonstrate an intellectual objective and an in-depth study that will contribute to the practice of architecture. The formulated problem should combine a theoretical search with the practical considerations of the profession. Research methods are identified that will provide the resources and information necessary for the design process. Post-occupancy building evaluations of similar problems are used to analyze technical assumptions, functional response and social reaction. (Credit: Variable) Credit: Variable

ARCH 591
Research and Thesis
The thesis research and development of ARCH 591 is premised on the view that design and research activities are inseparable and that knowledge production (theory) and formal production (practice) are methodologically linked. Marking the transition between the academic and professional worlds, the thesis work is an opportunity for each student to define an individual position with regard to a specific aspect of architectural practice. It is intended that the thesis project looks upon architectural and urban designs as formal and theoretical elaborations of the design-based research cloud studio ARCH 546 as well as the collective outcome of socio-political forces analyzed during thesis research. Thesis work leads towards the final acceptance of the presentation materials by the advisory committee. The text, reductions of the drawings, and representations using various media are bound together in a hard-cover volume, which is deposited in the Graham Resource Center and the Galvin Library. Credits: Variable; minimum total eight semester hours. Open only to Architecture majors. Credit: Variable

ARCH 593
Master's Project
The Masters Project is the culmination of both the two-year and three-year Master of Architecture curricula – the synthesis of architectural study into an independent project. The Project is, most commonly, the design of a building or in-depth research about specific aspects of the built environment. Specialized research and design within a wide range of architectural problems include site selection, consideration of architectural context and environmental impacts, development of user function and space programs, and architectural planning and design. Aesthetic and visual aspects and the intellectual foundations of the problem are carefully considered, as well as the technical aspects in the selection and integration of structural and environmental systems. Successful Masters project proposals will be grouped into "Areas of Focus" studios. After final acceptance of the presentation materials by the faculty advisor and the "Area of Focus" teaching faculty, the text, reductions of the drawings, and model photographs are bound together, which are deposited in the GRC and the University’s library. Prerequisite(s): ARCH 523 with min. grade of C Lecture: 0 Lab: 12 Credits: 6

ARCH 594
Research Problems
Credit: Variable

ARCH 595
Research in Progress Forum
Research in Progress Forum presents students with opportunities (lectures and reading discussions) to engage with other researchers in the fields of architectural history/theory and technologies of the built environment. Lecture: 0 Lab: 0 Credits: 0

ARCH 596
ARCH IPRO
Lecture: 0 Lab: 3 Credits: 3
ARCH 597
Special Problems
Credit: Variable

ARCH 600
Continuance of Residence
Lecture: 0 Lab: 1 Credits: 1

ARCH 601
Doctoral Methodology Pre-Seminar
This course provides a foundation for doctoral students in the diversity of research paradigms in architecture. The first component is an introduction to philosophy of knowledge with an emphasis on architecture. The second component entails a critical review and evaluation of diverse research methodologies in current doctoral architectural research. It is intended to provide substantial information on research methodologies not covered in undergraduate and graduate education. In this course students will write a series of papers that critically review the course readings and discussions.
Lecture: 3 Lab: 0 Credits: 3

ARCH 602
Crafting a Dissertation
This course provides a context in which doctoral students can formulate their dissertation proposals. Through reading and discussion of model research projects and methodological studies, students will examine the challenges and potentials of locating a dissertation topic, shaping a hypothesis, selecting methods and interpretive frameworks, conducting research, and articulating a compelling argument. The course addresses both pragmatic and intellectual aspects of research. A primary goal is the writing of a draft dissertation proposal as the basis for the Ph.D. comprehensive exam. The course will follow a seminar format requiring significant reading, writing, and class participation.
Prerequisite(s): ARCH 601 with min. grade of C
Lecture: 3 Lab: 0 Credits: 3

ARCH 611
Seminar in Theory and Technology I
It will explore the history of modern architectural theory from the late seventeenth-century to 1975 with special regard to technology and its relationship to architectural culture. At times architectural theory forms a backdrop to architectural practice while seemingly taking little account of technological events. At other times technology and its material innovations change the very nature of architectural practice and its discourse. The course will consist of short lecture, presentations, and discussion.
Lecture: 0 Lab: 3 Credits: 3

ARCH 612
Seminar in Theory and Technology II
It will form a continuation of ARCH 611 and consider the interface of theory and technology over the last thirty years. Students will take a more active role in tailoring their participation to advance their research in the dissertation and thesis topics they wish to pursue. Larger thematic issues of theory and technology will be considered within the richness of contemporary debates and competing interests. Students will present papers and a collective seminar document or publication will be produced.
Lecture: 0 Lab: 3 Credits: 3

ARCH 690
Research and Analysis Studio
Each research project must demonstrate an intellectual objective and an in-depth study that will contribute to the practice of architecture. The formulated problem should combine a theoretical search with the practical considerations of the profession. Research methods are identified that will provide the resources and information necessary for the design process. Post-occupancy building evaluations of similar problems are used to analyze technical assumptions, functional response, and social reaction.
Credit: Variable

ARCH 691
Doctoral Research
Credit: Variable

ARCH 801
Introduction to Architecture: Graduate Architectural Studio Preparatory
The emphasis of the course is on the fluid integration of manual and digital modes of representation into a cohesive process - a skill set essential for navigating the architectural studio. Concepts and techniques covered will be the foundational skills of the architect; the various modes of freehand drawing, imaging, descriptive and analytic orthographic projection, and architectural model-making.
Lecture: 0 Lab: 0 Credits: 0