

# Architecture (ARCH)

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Course information contained within the Bulletin is accurate at the time of publication in July 2024 but is subject to change. For the most up-to-date course information, please refer to the Course Catalog.

## **ARCH 5011. Graduate Representation Intensive 1. 3 Credit Hours.**

This course focuses on the development of visual literacy, graphic techniques, and 3D formal exploration. Through projects supported by research, graphically-based exercises, and formal investigations, students will be exposed to the process of representation in architecture. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

## **ARCH 5012. Graduate Representation Intensive 2. 3 Credit Hours.**

This course focuses on the development of visual literacy, graphical techniques, and 3D formal exploration. Through projects supported by research, graphically-based exercises, and formal investigations, students will be exposed to the process of representation in architecture. Methods of 2D and 3D analog and digital representation will be addressed. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

## **ARCH 5013. Facilities for Health Workshop 1. 3 Credit Hours.**

The workshop uses interdisciplinary and collaborative approaches to address innovation in health design and facilities. The workshop focuses on human factors and dimensions, habits, and motions of the human body and human bodies as the initiator of design. As such, the workshop looks at issues such as movement, tactility, human engagement, mobility, and related factors as they relate to space and organization.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

## **ARCH 5014. Facilities for Health Workshop 2. 3 Credit Hours.**

The workshop uses interdisciplinary and collaborative approaches to promote innovation in health design and facilities. The workshop focuses on the spatial and procedural functions of healthcare facilities. As such, the workshop explores relationships between small and large user-groups, equipment, and various architectural configurations within healthcare facilities.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of B- in ARCH 5013.

## **ARCH 5015. Facilities for the Arts Workshop 1. 3 Credit Hours.**

The workshop uses interdisciplinary and collaborative approaches to address innovation in arts facilities design and planning. The workshop focuses on human factors and dimensions, habits, and motions of the human body and human bodies as the initiator of design. As such, the workshop looks at issues such as movement, tactility, human engagement, mobility, and related factors as they relate to space and organization.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5016. Facilities for the Arts Workshop 2. 3 Credit Hours.**

The workshop uses interdisciplinary and collaborative approaches to address innovation in arts facilities design and planning. The workshop focuses on the spatial and procedural functions of arts facilities. As such, the workshop explores relationships between small and large user-groups, equipment, and various architectural configurations within arts facilities.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of B- in ARCH 5015.

**ARCH 5017. Facilities Workshop 1. 3 Credit Hours.**

The workshop uses interdisciplinary and collaborative approaches to address innovation in facilities design and planning. The workshop focuses on human factors and dimensions, habits, and motions of the human body and human bodies as the initiator of design. As such, the workshop looks at issues such as movement, tactility, human engagement, mobility, and related factors as they relate to space and organization.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5018. Facilities Workshop 2. 3 Credit Hours.**

The workshop uses interdisciplinary and collaborative approaches to address innovation in facilities design and planning. The workshop focuses on the spatial and procedural functions of facilities. As such, the workshop explores relationships between small and large user-groups, equipment, and various architectural configurations within facilities.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of B- in ARCH 5017.

**ARCH 5033. Project Planning and Programming. 3 Credit Hours.**

A course covering the general processes related to the planning, programming, design, construction and occupancy of facilities, including long range, strategic and tactical planning, the relationship between facility planning and business planning, organization of sites, buildings and interiors. Also covered are specific tools and techniques for these functions, including design and construction documentation and contracts, facility inventories, space planning and relocation management, construction and installation specifications, value engineering, post-occupancy evaluation, contract management and cost estimating techniques.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5096. Health Facilities Practice and Management. 3 Credit Hours.**

The course exposes students to the history, development and current status of the health facilities management profession and develops understandings of the trends and dynamics of contemporary health facilities management practice.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of B- in ARCH 5131.

**ARCH 5122. Graduate Design Foundation Intensive. 6 Credit Hours.**

Students in this course will develop rigorous design thinking through making and the integration of material, craft, tectonic and visual practice. Development of the design crit plus methods of communicating design objectives. Scale: artifact, body and spatial envelope. Development of individual portfolio of design and graphic work as required for the M Arch degree.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5131. Form and Function in Health and Environments. 3 Credit Hours.**

The course examines the relationship of form, space, and function in healthcare facilities and environments. Using case studies of current facilities, the course looks at the role of design and particular needs for healthcare. The course examines the role of an interdisciplinary approach, where health experts, facilities and design experts, and other related professionals work together to develop state of the art healthcare facilities and environments.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5132. Current Topics in Health Facilities Planning and Design. 1 Credit Hour.**

The course examines trends and best practices in health facilities planning and design. Industry experts will present and discuss their work and share relevant case studies of leading projects in healthcare design and facilities. Topics include design processes and solutions, integrated strategic planning, client and community relationships, long-term projections for facilities, and post-occupancy evaluation. Note: This course may be taken up to three times provided that there is a different instructor each time. For further information, check with your advisor.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**ARCH 5133. Current Topics in Healthy Communities and Design. 1 Credit Hour.**

The course examines the role of design for human well-being, including physical, mental, and social health. Industry experts will present and discuss their work and share relevant case studies that explore the challenges, opportunities and successful strategies to create communities that encourage healthy practices. Topics include healthy buildings; social equity; healthy transportation networks; innovative urban design; active communities and public space; food access; high performance affordable housing; air quality; secure communities; and mobility and accessibility. Note: This course may be taken up to three times provided that there is a different instructor each time. For further information, check with your advisor.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**ARCH 5134. Current Topics in Resilience and Design. 1 Credit Hour.**

The course examines trends and best practices in how to design buildings, plan communities, and construct infrastructure that persist and thrive amid predicted and unforeseen disruptions. Industry experts will present and discuss their work and share relevant case studies in the purposeful design of buildings, communities, and regions capable of maintaining livable conditions when faced with an interruption of normal services. Topics include adaptation to a wide range of impacts as a result of climate change, such as increased intensity of storms, higher precipitation, coastal and inland flooding, increased severity of droughts, wildfires, warming temperatures, power outages, and thawing permafrost. Note: This course may be taken up to three times provided that there is a different instructor each time. For further information, check with your advisor.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**Course Attributes:** SI

**ARCH 5135. Current Topics in Energy and Performance. 1 Credit Hour.**

The course examines innovative practices used to predict and measure energy usage in buildings. Industry experts will present and discuss their work and share relevant case studies that explore the challenges, opportunities and successful strategies to design energy efficient, high performance buildings. Topics include energy modeling and simulations; energy-efficient building operations; energy-related problems in buildings; and metrics of energy flows in buildings. Note: This course may be taken up to three times provided that there is a different instructor each time. For further information, check with your advisor.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**ARCH 5136. Current Topics in Fabrication and Making. 1 Credit Hour.**

The course examines innovative design and fabrication techniques. Industry experts will present and discuss their work and share relevant case studies that explore tools, processes, and techniques by which products, components, and buildings are made. Topics include digital and analog fabrication; robotics; prefabrication; prototyping; and mass production. Note: This course may be taken up to three times provided that there is a different instructor each time. For further information, check with your advisor.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**ARCH 5137. Current Topics in Visualization. 1 Credit Hour.**

The course examines innovative practices used for the visualization, representation, and documentation of objects, buildings, and environments. Industry experts will present and discuss their work and share examples of the current tools and techniques. Topics include still image production such as rendering and collage; building information modeling; augmented and virtual reality; and animation. Note: This course may be taken up to three times provided that there is a different instructor each time. For further information, check with your advisor.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**ARCH 5138. Current Topics in Materials and Design. 1 Credit Hour.**

The course examines innovative materials and their applications and use in design. Industry experts will present and discuss their work and share relevant case studies. Topics will address a range of issues related to sustainable and advanced materials include traditional and novel materials and uses; responsive materials; smart materials; haptic technologies; manufacturing innovations. Note: This course may be taken up to three times provided that there is a different instructor each time. For further information, check with your advisor.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**College Restrictions:** Must be enrolled in one of the following Colleges: College of Public Health, Art Architecture, Tyler School.

**Course Attributes:** SI

**ARCH 5141. Architectural History 1: Ancient through Renaissance. 3 Credit Hours.**

Traces the history of Western architecture from the ancient world to the high renaissance and mannerism of the late 16th century. The evolution of architectural thought, various formal languages (styles) and theoretical concepts are studied through the examination of selected buildings within their specific political, social, economic, and cultural milieu. Emphasis on the analysis of the ancient temple and the Christian church. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5142. Introduction to Architectural Histories and World Contexts. 3 Credit Hours.**

This graduate survey course traces the long history of architectural formation from early civilization to early modernization of the 19th century. The evolution of architectural examples, design language, and environmental ideologies are studied through an intensive examination of select buildings from diverse cultures, contexts, and continents. The course introduces analytical methods for the study of significant buildings, influences of world building beyond the dominant canon, across a range of architectural styles and diverse historical scholarship. Students are expected to produce specific historical case study as a term paper, along with possible intermittent writing assignments and exams.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5152. Materials and Methods of Construction. 3 Credit Hours.**

Introduction to construction materials, fundamentals of building construction, methods of assembling building systems in an integrated manner, and costing. Introduces specific regulatory issues dealing with zoning regulations, building codes, and barrier-free access requirements within the context of contemporary building techniques. Methods of construction in wood, masonry, concrete, and steel are described in detail and issues of enclosure, roofing, insulation, and finishes are presented. The course carries technical drawing requirements. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5231. Graduate Design Studio 1. 6 Credit Hours.**

The house as essential site of architecture. Consideration of relationships between program, culture, society and form making at a domestic scale; consideration of structure, space, shelter and place making; methods of construction, tectonics and detailing as design concerns; introduction to precedent study as research technique. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of B- in ARCH 5122.

**ARCH 5232. Graduate Design Studio 2. 6 Credit Hours.**

Studio with environmental sustainability focus - energy and resource use, hydrology, sustainable materials, infrastructure and building methods, recycling, environmental performance and quality; emphasis on systems and details (very large and very small); development of techniques for environmental analysis (observation, data analysis etc.); development of ecological and environmentally responsive design proposals; program development; introduction to design collaboration. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Course Attributes:** SF

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of B- in (ARCH 5122 and ARCH 5231)

**ARCH 5251. Structural Analysis for Architects. 3 Credit Hours.**

This course covers loadings determination and evaluation, resolution and equilibrium of force systems, truss analysis, centroids, moments of inertia, shear and bending moment diagrams, basic beam, column, and system design. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5252. Str Des for Architects 1. 3 Credit Hours.**

Application of principles of engineering mechanics to layout, analysis, design, and detailing of structural elements in steel and wood of simple buildings. Flexural theory including elastic and plastic design is taught. Students will be familiarized with current building design codes as they relate to the structural design of building elements.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5253. Str Des for Architects 2. 3 Credit Hours.**

Application of principles of engineering mechanics to layout, analysis, design, and detailing of structural elements in concrete and masonry of simple buildings. Students will be familiarized with current building design codes as they relate to the structural design of building elements.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5296. Movements in Modern Architecture. 3 Credit Hours.**

History and theories of the architecture and urbanism of the modern period, from the beginning of the 19th century until the 1960's. Key ideas, texts and iconic buildings from the USA, Europe and other sites of the modernist diaspora are discussed. Development of individual portfolio of design work, a requirement for graduate students in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5351. Env Control Systems 1. 3 Credit Hours.**

This course discusses the thermal and environmental processes that affect buildings and develops techniques for designers to respond to and manipulate thermal environments in ways that are integral with other building systems. Mechanical, electrical, and plumbing systems, heating, ventilation, and air-conditioning (HVAC) equipment, vertical transportation, communication, security, and fire protection systems and introduced. These are discussed against a backdrop of the principles of sustainability and environmental responsibility.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Course Attributes:** SF

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5411. Career Preparation. 1 Credit Hour.**

In this course, students will learn essential strategies for professional career advancement including strong communication, salary negotiation, presentation, and networking skills. It will provide skills for career advancement, enabling students to increase their marketability as prospective employees.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5412. Portfolio Design and Career Preparation. 3 Credit Hours.**

This seminar will assist students in the creation of a unique and successful professional portfolio for use in job placement and career advancement. The course will provide an overview of design presentation tools necessary for effective communication. Students will also learn essential strategies for professional career advancement including strong communication, salary negotiation, presentation, and networking skills, enabling them to increase their marketability as prospective employees.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 5596. General Theories in Architecture. 3 Credit Hours.**

This seminar explores general theories of architecture and urbanism relevant to contemporary social, political, and cultural contexts. Using examples from both built and unbuilt works, including diverse sites, subjects and scales, this seminar critically examines an array of disciplinary formations, environmental histories, and design politics beyond the traditional canon. Participation in weekly writing, student-led discussions, and development of a research paper in response to critical feedback are expected.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8000. Spec Top Sem in Practice. 3 Credit Hours.**

Graduate level seminar to familiarize and engage students in issues of Integrated Practice. The course centers on a discussion of major impacts of practice, and the ethical issues and responsibilities that we are faced with in the current era where BIM has the potential to change the roles in built environment disciplines, and impacts of globalization and sustainability drive our needs. The course addresses changes brought on in technology and practice management. Discussion and research can span a range of issues that affect practice.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Course Attributes:** SF

**Repeatability:** This course may be repeated for additional credit.



**ARCH 8011. Advanced Architecture Design Studio 1. 6 Credit Hours.**

Design studio focused on civic architecture that addresses the relationship and integration of building and site. The studio introduces ideas of comprehensive design that will be addressed more fully in ARCH 8013. The studio addresses the relationship of conceptual ideas and how they are addressed through understanding natural phenomena (ex. light and air, tactility) and building tectonics. The course requires students to consider the relationship of precedent studies and design development. Students will be required to develop and advance representation and visualization techniques appropriate to the project, peer critique and self-evaluation skills.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Course Attributes:** SI

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8012. Elect Arch Des Studio. 6 Credit Hours.**

Advanced architectural design studio. The topic of the studio varies in accordance with faculty expertise and research focus. This might include, but not be limited to an area of architectural, spatial, social, cultural or political practice, an interdisciplinary intersection such as architecture + biology / geology / war / the media / gender or business; research into materials, energy, structure, scripting, fabrication or other computational technologies. The course develops observational techniques and data collection, management and visualization appropriate to the topic of the studio. It requires spatio / temporal / material development, resolution and representation of an architectural design strategy at appropriate scales. Collaboration with aligned fields or disciplines may be undertaken if it is appropriate to the topic of the studio. Peer critique and evaluation are utilized as learning techniques and the capacity for independent work is developed. The course must be taken once, but may be taken up to three times for required credits as long as the topic covered is substantially different each time.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 8013. Comprehensive Architecture Design Studio. 6 Credit Hours.**

Comprehensive Design Studio: the integration of structural and environmental systems, programming, tectonics and detailing into architectural design and expression in holistic and environmentally sustainable ways; comprehensive representation of design; development of time management skills, peer critique and self evaluation; interaction with consultants.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Co-requisites:** ARCH 8352.

**Course Attributes:** SF

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of C- in ARCH 5351.

**ARCH 8014. Architectural Design for Health. 6 Credit Hours.**

Advanced architectural design studio focused on design for health and health facilities. This will include understanding of human factors, equipment needs and trends, health design guidelines, design for well-being, etc. The course develops observational techniques and data collection, management and visualization appropriate to the topic of the studio. It requires spatio / temporal / material development, resolution and representation of an architectural design strategy at appropriate scales. Collaboration with aligned fields or disciplines may be undertaken if it is appropriate to the topic of the studio. Peer critique and evaluation are utilized as learning techniques and the capacity for independent and collaborative design work is developed.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8015. Urban Ecologies and Design. 6 Credit Hours.**

Advanced architectural design studio focused on urban design. This will include understanding of human and community well-being in urban environments, environmental design trends, urban design guidelines, etc. The course develops observational techniques and data collection, management and visualization appropriate to the topic of the studio. It requires spatio / temporal / material development, resolution and representation of an architectural design strategy at appropriate scales. Collaboration with aligned fields or disciplines may be undertaken if it is appropriate to the topic of the studio. Peer critique and evaluation are utilized as learning techniques and the capacity for independent and collaborative design work is developed.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8016. Advanced Technologies and Design. 6 Credit Hours.**

Advanced architectural design studio focused on advanced technologies in architectural design. This can include the range of current and emerging technologies in design process and implementation, visualization, etc. The course develops observational techniques and data collection, management and visualization appropriate to the topic of the studio. It requires spatio / temporal / material development, resolution and representation of an architectural design strategy at appropriate scales. Collaboration with aligned fields or disciplines may be undertaken if it is appropriate to the topic of the studio. Peer critique and evaluation are utilized as learning techniques and the capacity for independent and collaborative design work is developed.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8096. Professional Practice. 3 Credit Hours.**

The course is required for internship in the architectural profession. It exposes students to the history, development and current status of the architectural profession and professional education and develops understandings of the trends and dynamics of contemporary architectural practice. It discusses what is required to properly serve clients and the common good; how to pursue, win, negotiate and prepare agreements and contracts; how to organize, manage, design, control costs, produce and administer contracts for the construction of architectural projects and how to organize, build and maintain architectural firms.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8100. Spec Top Case St in Arch. 3 Credit Hours.**

Graduate level seminar that centers on comprehensive case studies in architecture as a form of primary research. The seminar discussion and research will focus on architectural works with the aim of learning about important aspects and overlaps that make architecture. In each case, the topics that drive the research and analysis will vary. Topics and issues will be guided by class discussion and the nature, scale and context of the architectural works. The course will address methods of analysis and techniques for visualization and presentation. It requires active participation in class discussions.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 8131. Arch Research Seminar 1. 3 Credit Hours.**

Graduate level research seminar to familiarize and engage students in an area of contemporary urban research, its history, networks, strategies and techniques. It will develop methods and skills for the research and analysis of urban systems, economies, structures, infrastructures, spaces and / or cultures and techniques to visualize data and present research findings. The topic of the seminar varies in accordance with faculty expertise and research focus and might include, but not be limited to, approaches to sustainable urban development, ludic urban design strategies, advocacy based urbanism, user generated cities, computational urbanism, etc. The course takes a seminar format and requires active participation in class discussions. The course is required to be taken once in conjunction with ARCH 8011, but may be taken again for elective credit provided that the topic covered is different each time.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Course Attributes:** SI

**Repeatability:** This course may be repeated for additional credit.

**ARCH 8132. Arch Research Seminar 2. 3 Credit Hours.**

Graduate level seminar to familiarize and engage students in an area of contemporary architectural research, its history, networks, strategies, techniques. The topic of the seminar varies in accordance with faculty expertise and research focus. This might include, though not be limited to, questions about research as architectural practice, about architectural design as research, about architectural history, about architecture as spatial or political practice, or engage in any one of the interdisciplinary intersections currently re-energizing architecture - architecture + biology / war / media studies / post-colonial studies / gender studies / business etc. The course will develop methods and skills for architectural research and analysis and techniques for data visualization and research presentation. The course takes a seminar format and requires active participation in class discussions. The course is required to be taken once, but may be taken again for elective credit provided that the topic covered is different each time

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may be repeated for additional credit.



**ARCH 8133. Arch Research Seminar 3. 3 Credit Hours.**

Graduate level seminar to familiarize and engage students in contemporary research in an area of architectural technology, its history, networks, strategies and techniques. The topic of the seminar varies in accordance with faculty expertise and research focus. This might include, though not be limited to materials research, energy research, structural research, fabrication, computational technologies, etc. The course will examine the history of the field, develop methods and skills for research and analysis and techniques for data visualization and research presentation. The course takes a seminar format and requires active participation in class discussions. The course is required to be taken once, but may be taken again for elective credit provided that the topic covered is different each time.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 8134. Architecture Research Seminar 4 - Urban Innovations: Technology, Environment and Health in Society. 3 Credit Hours.**

Graduate level research seminar to familiarize and engage students in an area of current and future trends and innovations in the urban context with a focus on technology, environment, and health. It will develop methods and skills for the research and analysis of urban systems, economies, structures, infrastructures, spaces and / or cultures and techniques to visualize data and present research findings. The topic of the seminar includes approaches to innovation and the integration of technology, natural and designed systems, strategies for a holistic approach to sustainability and healthy cities, human and environmental health and well-being. The course takes a seminar format and requires active participation in class discussions. The course is required to be taken by students in the Architecture for Health concentration of the MS Architecture degree and is an elective for other students.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Course Attributes:** SF

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8146. Graduate Field Work Report. 1 Credit Hour.**

This course requires that students prepare an independent report of their study abroad, field work, or internship experience in a format that is agreed upon with the course coordinator.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 8233. Arch Des St Tokyo (G). 6 Credit Hours.**

A complex design investigation incorporating analysis of urban systems, observational research, data collection and analysis and the study of architectural precedents. The course immerses students in a foreign urban and architectural culture and asks them to engage in a complex design investigation, whose topic and scale is variable. Course may be used as equivalent of ARCH 8012 but may only be taken once.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8234. Arch Des Studio Rome (G). 6 Credit Hours.**

A complex design investigation incorporating analysis of urban systems, observational research, data collection and analysis and the study of architectural precedents. The course immerses students in a heritage urban and architectural locale and asks them to engage in a complex design investigation, whose topic and scale is variable. Course may be used as equivalent of ARCH 8012 but may only be taken once.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8241. Seminar: Analysis Urb Str (G). 3 Credit Hours.**

Research on urban systems and forms that have marked the development of Italian and Roman architecture from the 15th to the 18th century and that are now a reference point in every Western city: the piazza, the Roman palazzo, the theatre, the garden. The course is intended as a theoretical and analytical complement to the graduate architecture design studio in Rome. It fulfils the requirements of ARCH 8132.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8242. Urban Seminar Tokyo (G). 3 Credit Hours.**

This course provides students an overview of architecture and urbanization in historic and contemporary Japan. Economic, socio-political and technological forces that have shaped the built environment and architecture are discussed and the work of contemporary Japanese architects are studied and analyzed. The course is a theoretical and analytical complement to the Architecture Design Studio. It fulfills the requirements of ARCH 8132.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may not be repeated for additional credits.

**ARCH 8352. Environmental Control Systems 2. 3 Credit Hours.**

This course covers visual and audio environmental stimuli and architectural design responses to them. In addition, it discusses and introduces techniques for measuring the design of building systems for improved environmental performance, in terms of the efficiency of systems, environmental impact and capital and operational costs.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Co-requisites:** ARCH 8013.

**Course Attributes:** SF

**Repeatability:** This course may not be repeated for additional credits.

**Pre-requisites:** Minimum grade of C- in ARCH 5351.

**ARCH 9182. Independent Study in Architecture. 1 to 3 Credit Hour.**

Graduate level independent study carried out by students interested in research that focuses on the various subdisciplines in architecture. Students must submit a proposal to a faculty member for review and approval that follows departmental guidelines for independent study. Topics and issues that guide the independent study can vary.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9280. Special Topics in Communication. 1 to 3 Credit Hour.**

Graduate level course that addresses current topics in graphic and visual communication in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9285. Architecture Internship. 1 to 3 Credit Hour.**

This course expands students' knowledge and professional experience through internships in architectural and other built environment firms. Students will be exposed to methods of practice and design thinking. The course requires that the student prepare a report in a format agreed upon with the course coordinator.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9380. Special Topics in History or Culture. 1 to 3 Credit Hour.**

Graduate level course that addresses current topics related to architectural history and/or cultural studies.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9480. Special Topics in Technology. 1 to 3 Credit Hour.**

Graduate level course that addresses current topics in digital or building technology in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9580. Special Topics in Site and Context. 1 to 3 Credit Hour.**

Graduate level course that addresses current topics in site and context in architecture.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9682. Independent Research. 1 to 3 Credit Hour.**

Graduate level independent research in architecture. Students work with a faculty member according to an agreed upon syllabus and schedule. Topics and issues that guide the course work will vary.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9991. Directed Research. 3 Credit Hours.**

The development of a self motivated architectural design inquiry under the guidance of a faculty co-coordinator. This includes design research, the development of a design program, site investigation, analytical and speculative design investigations and / or experimentation with advanced visualization techniques. The course is seminar based and engages students in critical dialogue with their own and other students' work. It prepares students for undertaking an architectural design thesis the following semester.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may be repeated for additional credit.

**ARCH 9996. Architecture Design Thesis. 1 to 6 Credit Hour.**

Self directed architectural design thesis that follows on the research and design inquiries conducted in the fall semester. The course requires that students demonstrate the ability to undertake design research, develop a design program, conduct analytical and speculative design investigations and utilize advanced visualization techniques in the representation of their work. It culminates in a formal juried presentation and a textual document of a publishable standard of a graduate level design thesis.

**Level Registration Restrictions:** Must be enrolled in one of the following Levels: Graduate.

**Degree Restrictions:** Must be enrolled in one of the following Degrees: Master of Architecture.

**Repeatability:** This course may be repeated for additional credit.