ARCHITECTURE (ARCH)

ARCH Class Schedule (https://courses.illinois.edu/schedule/DEFAULT/DEFAULT/ARCH)

Courses

ARCH 101  Introduction to Architecture  credit: 3 Hours.
An introduction to architecture, architectural education and the profession with emphasis on issues that influence architecture and the people and processes involved.

ARCH 164  Architecture as a Second Language  credit: 3 Hours.
The conceptual toolbox used by architects, and the tools in it, are unique and used by architects in both expected and unexpected situations. These tools can be thought of as a second language. Architecture as a Second Language is a hands-on, experiential online course that immerses students in challenging activities similar to those architects face. The course helps develop new perspectives, capabilities, and insights that can be applied to any calling or discipline.

This course satisfies the General Education Criteria for: Humanities - Lit Arts

ARCH 171  Concepts and Theories of Architectural Design  credit: 3 Hours.
This course introduces basic theories of architecture. It creates awareness of design concepts. Course content is arranged in three topical areas: Architecture and People, Architecture and Place, and Making Architecture. Each topical area addresses roles of designers and architects in contemporary and historical perspectives.

ARCH 172  Drawing and Modeling  credit: 3 Hours.
Introduction to the architectural graphic communication skills that architects use to visualize, analyze, and record creative thoughts: freehand sketching, architectural delineation, and digital applications.

ARCH 199  Undergraduate Open Seminar  credit: 1 to 5 Hours.
May be repeated.

ARCH 210  Introduction to the History of World Architecture  credit: 3 Hours.
An introduction to the history of World Architecture, Urbanism, and the built environment from pre-history to the present; in addition to examining the formal properties of global architecture, this course explores buildings and cities in their cultural, social, political, and religious contexts. Prerequisite: Sophomore standing or consent of instructor.

ARCH 222  Islamic Gardens & Architecture  credit: 3 Hours.
Same as LA 222. See LA 222.
This course satisfies the General Education Criteria for: Humanities - Hist Phil Cultural Studies - Non-West

ARCH 231  Anatomy of Buildings  credit: 4 Hours.
A holistic approach to the introduction of architectural technology. Enabling students to integrate technical material with design, this lecture/lab course addresses building codes, zoning, construction documentation and delivery, digital fabrication, and the impact of energy, sustainability, and environmental forces on building construction, comparing general principles of light frame and heavy construction materials, components, and systems. Students learn how to build virtually and physically, understanding the roles design and construction professionals play on integrated teams.

ARCH 232  Structural Fundamentals  credit: 4 Hours.
The study of forces, their distribution, and their impact on building structure. Topics include: equilibrium of rigid bodies in two and three dimensions; trusses; shear and bending moments in beams; arches and frames; stresses, strains, and deformations in axially loaded members; direct shear and bearing stresses; torsion; beam stresses and deflections; introduction to the design of structural members; and architectural applications. Prerequisite: MATH 220 or MATH 221, and MATH 231 or PHYS 101.

ARCH 273  Strategies of Architectural Design  credit: 3 Hours.
Focuses on understanding architecture as holistic synthesis of principles, technology and form. Content is arranged in six areas: Research and Analysis, Typology Analysis, Street Analysis, Block Analysis, Neighborhood Analysis, and Development and Presentation. Students work both on individual assignments and in teams on design projects. Emphasis on combining graphic and modeling skills with analytical skills. Exercises require demonstration of skills and concepts introduced in earlier design and technology courses.

ARCH 274  Representation  credit: 3 or 4 Hours.
Develops understanding of the representation of ideas, values, and meaning in the built environment. Focuses on three topic areas: analysis, technical communication, and modeling. Exposure to multiple software tools and mastery of basic skills in each.

ARCH 300  Ind Studies in Urban Design  credit: 3 Hours.
The individual study of selected topics involving the history, design, and function of significant European cities. Prerequisite: One year of history of architecture or Art History, consent of instructor.

ARCH 314  History of World Landscapes  credit: 4 Hours.
Same as LA 314. See LA 314.
This course satisfies the General Education Criteria for: Advanced Composition Humanities - Hist Phil Cultural Studies - Western

ARCH 321  Environment, Architecture, and Global Health  credit: 3 Hours.
This course surveys current research at the intersection of the built environment, health, and well-being. It emphasizes relationships among people and multiple scales of the environments they inhabit and the health and well-being consequences of these relationships. It comparatively examines these relationships within a broad range of Western and Non-Western cultures and contexts by introducing significant historical and contemporary theories, data of relevance, research processes, and applications in environmental design and planning processes. To improve person-environment fit, the roles of social groups, institutions, and organizations in the person-environment-health/well-being nexus within various cultural and geographic contexts are examined and compared.

ARCH 341  Environment Tech HVAC  credit: 4 Hours.
Study of the control of thermal environment, mechanical and related building sub-systems, and their integration into the overall building design. The specific topics include: thermal comfort and behavioral implications; fundamentals of thermal behavior of buildings; the principles of heat and moisture in buildings; indoor air quality and “Sick Building Syndrome”; energy and sustainability implications of building design; and mechanical systems including HVAC and plumbing systems. Prerequisite: ARCH 233.
ARCH 342  Environment Tech Ltg & Acoust  credit: 4 Hours.
Study of the control of luminous and sonic environments, the supporting
building systems, and their integration into the overall building design.
Specific topics include: lighting fundamentals; light sources; effects
of lighting on comfort and performance; lighting calculations and
design; energy economy and sustainability; acoustic fundamentals;
room acoustics; noise control; and basic electrical and sound systems.
Prerequisite: ARCH 233.

ARCH 351  Statics & Dynamics  credit: 4 Hours.
Study of equilibrium of rigid bodies in two and three dimensions;
trusses; shear and bending moments in beams; arches and frames;
cables; friction; introduction to dynamics; architectural applications.
Prerequisite: MATH 220 or MATH 221; and MATH 231 or PHYS 101.

ARCH 352  Mech of Mat & Design Appl  credit: 4 Hours.
Study of stresses, strains, and deformations in axially loaded members;
direct shear and bearing stresses; torsion; beam stresses and
deflections; stresses under combined loading; column buckling; design of
structural members; introduction to statically indeterminate structures;
architectural applications. Prerequisite: ARCH 351.

ARCH 373  Arch Design and the Landscape  credit: 5 Hours.
Building design in a landscape setting; creation of place; schematic
building design and site planning issues, universal design and
accessibility; principles of energy efficient building design; human-
environment relationship issues; and architectural design and
presentation methods; required field trips. Prerequisite: ARCH 272.

ARCH 374  Arch Design and the City  credit: 5 Hours.
Building design in the community setting; creation of place; introductory
urban design and site planning issues, including universal design and
accessibility, human-built environment relationship issues; architectural
design and presentation methods; required field trips. Prerequisite: ARCH 373.

ARCH 399  Study in Versailles, France  credit: 0 to 18 Hours.
Study in the University of Illinois Architectural Program at Versailles,
France. Approved for S/U grading only. Prerequisite: Concurrent
registration in the Versailles, France Study Abroad Program.

ARCH 400  Senior Honors in Architecture  credit: 1 to 4 Hours.
For candidates for honors in Architecture. Independent guided study
and research in a selected area of architecture. 1 to 4 undergraduate
hours. No graduate credit. May be repeated to a maximum of 6 hours
with consent of Director of School. Prerequisite: Senior standing
in architecture, a University grade-point average of 3.0 or, in special cases,
consent of Director of School.

ARCH 401  Independent Study  credit: 0 to 4 Hours.
Independent guided study and investigation in a selected area of
architecture. 0 to 4 undergraduate hours. 0 to 4 graduate hours. Approved
for both letter and S/U grading. May be repeated. Prerequisite: Junior
standing in architecture, written proposal approved by a sponsoring
faculty member and the approval of the Director of the School.

ARCH 402  Intro to Hist of Arch Theory  credit: 3 Hours.
Architectural theory, criticism, and historiography from antiquity to the
present. Based on close readings of texts from antiquity to the present
day. 3 undergraduate hours. 3 graduate hours. Prerequisite: Sophomore
standing.

ARCH 403  Spec Topics in Arch History  credit: 3 Hours.
Special topics in Architectural History courses. Topics and subject matter
to be published in course listings. 3 undergraduate hours. 3 graduate
hours. May be repeated in separate terms to a maximum of 6 hours.
Prerequisite: ARCH 210 and sophomore standing.

ARCH 407  Rome: The Eternal City  credit: 3 Hours.
Considers the architecture and urbanism of the city of Rome across time.
Special focus will be placed on critical strategies for understanding urban
sites. 3 undergraduate hours. 3 graduate hours. Prerequisite: Sophomore
standing.

ARCH 409  Special Topics in Spanish Arch  credit: 3 Hours.
Explores aspects of the architecture and urban design of Spain from
antiquity until the present. 3 undergraduate hours. 3 graduate hours. May
be repeated to a maximum of 6 hours. Prerequisite: ARCH 210.

ARCH 410  Ancient Egyptian & Greek Arch  credit: 3 Hours.
Architecture and urban form in Egypt and the Greek world through the
Hellenistic period. Same as CLCV 410. 3 undergraduate hours. 3 graduate
hours. Prerequisite: ARCH 210, ARTH 111 or CLCV 131.

ARCH 411  Ancient Roman Architecture  credit: 3 Hours.
Architecture and urban form in the ancient Roman world from the
Etruscans through the Late Antiquity. Connections between Roman
Late Antique, Early Christian, and Byzantine Architecture will be
considered. Same as CLCV 411. 3 undergraduate hours. 3 graduate
hours. Prerequisite: ARCH 210; ARTH 111, CLCV 131, or CLCV 132.

ARCH 412  Medieval Architecture  credit: 3 Hours.
Explores aspects of the architecture and urban design of medieval
Europe from late antiquity to the late Middle Ages (approximately
300-1400). Same as MDVL 412. 3 undergraduate hours. 3 graduate
hours. Prerequisite: ARCH 210 or ARTH 111.

ARCH 413  Renaissance Architecture  credit: 3 Hours.
Developments in architecture, urban design, and garden art in Italy
and northern Europe in the fifteenth through the sixteenth centuries.
3 undergraduate hours. 3 graduate hours. Prerequisite: ARCH 210,
ARTH 112, or consent of instructor.

ARCH 414  Baroque & Rococo Arch  credit: 3 Hours.
Developments in architecture, urban design, and garden art in Italy,
France, Germany, and England in the seventeenth and eighteenth
centuries. 3 undergraduate hours. 3 graduate hours. Prerequisite:
ARCH 210, ARTH 112, or consent of instructor.

ARCH 415  Neoclass & Nineteen Cent Arch  credit: 3 Hours.
Evolution of Continental and British architecture and urban planning from
1750 to World War I; includes some reference to American architecture of
the same period. 3 undergraduate hours. 3 graduate hours. Prerequisite:
ARCH 210 or ARTH 112, or consent of instructor.

ARCH 416  Modern American Architecture  credit: 3 Hours.
Development of American architecture and urban planning from the
seventeenth century to the present. 3 undergraduate hours. 3 graduate
hours. Prerequisite: ARCH 210, ARTH 112, or consent of instructor.

ARCH 417  Twentieth-Century Architecture  credit: 3 Hours.
Developments in Western architecture and urban design from 1900 to
the present; examines the rise of modernism in Europe and after World
War II; includes work in the United States, India, Japan, and Australia.
3 undergraduate hours. 3 graduate hours. Prerequisite: ARCH 210 or
ARTH 112, or consent of instructor.

ARCH 418  Hist of the Urban Environment  credit: 3 Hours.
Examines the evolution of town planning and urban design in Western
civilization from prehistory to the present; studies cultural and
technical advancements affecting the form of the urban environment. 3
undergraduate hours. 3 graduate hours.
ARCH 419 Historic Building Preservation  credit: 3 Hours.
Introduces historic preservation: legal, financial, and administrative assistance, graphic examination of restored buildings and sites, and application of conservation technology. 3 undergraduate hours. 3 graduate hours.

ARCH 423 Soc/Beh Factors for Design  credit: 3 Hours.
Research-oriented introduction to existing social and behavioral knowledge, methods, and tools for relating man to his physical and social environment, with implications for theories and a philosophy of architectural design. 3 undergraduate hours. 3 graduate hours. Prerequisite: Consent of instructor.

ARCH 424 Gender & Race in Contemp Arch  credit: 3 Hours.
Analyzes how the built environment reflects social attitudes towards gender and race. Identifies the work of women and people of color in architecture and related disciplines as consumers, critics, and creators of the environment. Provides links with valuable professional networks in Chicago and elsewhere. Same as GWS 424. 3 undergraduate hours. 3 graduate hours. Prerequisite: Consent of instructor.

ARCH 433 Design of Steel and Reinforced Concrete Structures  credit: 4 Hours.
Loads and load combinations; design methods/structural safety; steel as a structural material; design of structural steel members subject to tension, compression, bending, shear, and combined forces as well as bolted and welded joints. Reinforced concrete as a structural material; transformed sections; design for bending, shear, and serviceability; design of one-way slabs and columns. 4 undergraduate hours. 4 graduate hours. Credit is not given for both ARCH 433 and ARCH 451; credit is not given for both ARCH 433 and ARCH 452. Prerequisite: ARCH 232.

ARCH 434 Environmental Control Systems I  credit: 5 Hours.
Study of the control of thermal, luminous, and sonic environments with an emphasis on passive means of controls. Specific topics include: thermal comfort and behavioral implications; fundamentals of thermal behavior of buildings; the principles of heat and moisture in buildings; lighting fundamentals; light sources; effects of lighting on comfort and performance; energy economy and sustainability; acoustic fundamentals; room acoustics; noise control; basic electrical, plumbing, vertical transportation, and life safety systems. 5 undergraduate hours. 5 graduate hours. Prerequisite: Concurrent enrollment in ARCH 374 or consent of instructor.

ARCH 435 Structural Systems and Construction Methods  credit: 4 Hours.
Presents a unified approach to architectural structures and construction technology to enable students to integrate design, engineering, and construction, while providing an understanding of how material/component/system decisions impact the work of architects, engineers, and constructors. Using a series of case-studies and project-based assignments, students learn about the various structural systems and construction methods used in the design of buildings. The evolution and state-of-the-art in structure and construction strategies will be discussed to provide requisite breadth and depth. Topics covered include: structural and building codes; structural systems and their layout planning; foundation systems; construction methods and technologies in wood, steel, concrete, and masonry; sustainability considerations; detailing; and digital modeling. 4 undergraduate hours. 4 graduate hours. Prerequisite: ARCH 231 and ARCH 232.

ARCH 441 Heat and Moisture in Buildings  credit: 3 Hours.
Provides information and skills necessary for the designer to deliver dry, durable and healthful buildings. First half covers theory, including heat transfer, psychrometrics, steady-state diffusion and conduction analysis, and transient analysis. Second half covers building applications: roofs, walls, windows, foundations, and mechanical systems. 3 undergraduate hours. 3 graduate hours. Prerequisite: ARCH 341 or equivalent.

ARCH 451 Theory & Design Steel & Timber  credit: 4 Hours.
Analysis and design of steel and timber structures for buildings. Steel columns, beams, trusses, connections, roof and floor framing systems; timber beams, columns, roof and floor framing systems. 4 undergraduate hours. 4 graduate hours. Prerequisite: ARCH 352.

ARCH 452 Theory of Reinforced Concrete  credit: 4 Hours.
Concrete materials; behavior of reinforced concrete construction; behavior and design of structural elements, one-way slabs, beams, and girders; columns; ACI code requirements; and introduction to continuity in reinforced concrete structures. Course Information: 4 undergraduate hours. 4 graduate hours. Prerequisite: ARCH 352.

ARCH 460 International Architecture  credit: 4 Hours.
Interdisciplinary opportunity to focus on, study, and record the design and planning of cities and rural settlements in other cultures. Through directed study and participation in the intellectual environment of a foreign university, students analyze unfamiliar settings, developing insights to enrich their professional development. 4 undergraduate hours. 4 graduate hours. May be repeated in separate terms to a maximum of 8 hours. Prerequisite: Junior standing or higher in the School of Architecture, Department of Landscape Architecture, or the Department of Urban and Regional Planning.

ARCH 461 Critical Travel Documentation  credit: 4 Hours.
Modern and historic city forms and rural practices are analyzed while experiencing the realities of daily life traveling in another culture. Journals include drawings and writings that record buildings, environs, and landscapes. 4 undergraduate hours. 4 graduate hours. May be repeated in separate terms to a maximum of 8 hours. Prerequisite: Junior standing or higher in the School of Architecture, the Department of Landscape Architecture, or the Department of Urban and Regional Planning.

ARCH 468 Overseas Architectural Studies  credit: 3 Hours.
This course is designed to enrich the professional development of students in a study abroad location. Students participate in thematic workshops, seminars, lectures and field trips focused on understanding and analyzing architectural and urbanistic landmarks and settings on site through both directed and independent assignments. 3 undergraduate hours. No graduate credit. May be repeated in separate terms up to 6 hours. Prerequisite: Senior standing in the School of Architecture.

ARCH 471 Fundamentals of Arch Design  credit: 6 Hours.
Basic architectural design methods, fundamentals, principles and concepts including creative problem solving in two- and three-dimensions. 6 undergraduate hours. 6 graduate hours. Prerequisite: Limited graduate standing in Architecture and concurrent enrollment in ARCH 231.

ARCH 472 Arch Des in Landscape & Cities  credit: 6 Hours.
Intermediate architectural design methods, fundamentals, principles and concepts focusing on buildings in landscape and urban contexts. 6 undergraduate hours. 6 graduate hours. Prerequisite: ARCH 471 and concurrent enrollment in ARCH 233.
ARCH 473  Architectural Design and Performance  credit: 6 Hours.
Schematic design and development of a small-scale public building
e mphasizing the integration of the basic elements of building: materials,
details, structure, technology, program, life safety, and universal design.
6 undergraduate hours. 6 graduate hours. Prerequisite: ARCH 371 and
ARCH 372.

ARCH 474  Architectural Design and Making  credit: 6 Hours.
Building design that emphasizes the creative process of making,
experimentation, and theories of contemporary methods and materials.
Projects focus on translating design ideas at multiple scales into reality
through computation, representation, or production, utilizing fabrication
processes. Outcomes foreground entrepreneurial design thinking
and team-based learning. 6 undergraduate hours. 6 graduate hours.
Prerequisite: ARCH 473.

ARCH 475  Arch Design & Development  credit: 6 Hours.
Schematic design and development of a small-scale public building
emphasizing the integration of the basic elements of building: materials,
details, structure, technology, program, life safety, and universal design.
6 undergraduate hours. 6 graduate hours. Prerequisite: ARCH 374 or
ARCH 472.

ARCH 476  Arch Design & Exploration  credit: 6 Hours.
Exploration of boundaries of architecture and the built environment.
Focused exploration into specific design topics, such as issue-oriented
building problems, urban design theory, intermediate building design
and site planning theory, human-environment relationship theory,
interdisciplinary design, and architectural design and presentation
methods. 4 undergraduate hours. 4 graduate hours. Prerequisite: ARCH 475.

ARCH 490  Special Topics in Contemporary Architecture  credit: 1 to 4
Hours.
Selected topics in and applications of contemporary architecture;
see Class Schedule or department office for current topics. 1 to 4
undergraduate hours. 1 to 4 graduate hours. May be repeated in separate
terms up to 12 undergraduate hours or 8 graduate hours, if topics vary.
Prerequisite: Consent of instructor. For majors only.

ARCH 491  Arch Professional Internship  credit: 0 Hours.
Full-time or part-time professionally supervised field experience in
design intended to introduce students to the practice of architecture
in a commercial firm or agency of government. Students work in the
school-approved firm or agency of their choice. Written work reports
and reflective experiential learning reports are required. 0 undergraduate
hours. 0 graduate hours. Approved for S/U grading only. May be repeated
in separate terms a maximum of 3 times.Prerequisite: Graduate standing
or upper-level undergraduate standing, or consent of instructor. For
students enrolled in the BSAS and M.Arch. programs of study only.

ARCH 498  Directed Research in Arch  credit: 1 to 4 Hours.
Participation in on-going research projects which may include energy
management, environmental perception, facilities development, building
science, and other topics. 1 to 4 undergraduate hours. 1 to 4 graduate
hours. May be repeated to a maximum of 8 hours. Prerequisite: Approval
of written proposal by instructor and Director of School.

ARCH 499  Off-Campus Study  credit: 0 to 12 Hours.
Provides opportunity for approved off-campus study. Detailed proposal
for study off campus must be submitted for approval to the appropriate
committee in the School prior to such study. Final determination
of credit and its application toward the degree is made after a review of the
student’s off-campus work by the above committee and the Director of
School. 0 to 12 undergraduate hours. 0 to 12 graduate hours. Approved
for both letter and S/U grading. Prerequisite: Senior or graduate standing
in architecture and approval of program prior to registration.

ARCH 501  Architectural Practice  credit: 3 Hours.
Role of the architect in the building enterprise, professional ethics, and
the conduct of professional practice; legal aspects of architectural
practice and building construction; introduction of business
management, marketing, operational procedures, financial planning,
and cost control of architectural practices; and the administration of
construction contracts. Prerequisite: Graduate standing or consent of
instructor.

ARCH 502  Structural Planning  credit: 4 Hours.
General problems in the selection and design of structural systems for
buildings; methods of analysis; site explorations, soils, and foundations;
bracing; and special systems. Prerequisite: ARCH 451 and ARCH 452.

ARCH 510  History of World Landscapes  credit: 4 Hours.
Same as LA 513. See LA 513.

ARCH 511  Seminar in Ancient Arch  credit: 3 Hours.
Seminar on topics in ancient architecture. Prerequisite: ARCH 410, or
equivalent as determined by the instructor.

ARCH 512  Seminar in Medieval Arch  credit: 3 Hours.
Seminar on topics in medieval architecture. Same as MDVL 512. May be
repeated to a maximum of 12 hours in the same or subsequent terms.
Prerequisite: ARCH 411, ARCH 412, or equivalent as determined by the
instructor.

ARCH 513  Sem in Ren & Baroque Arch  credit: 3 Hours.
Seminar on topics in European architecture from the fifteenth through
the eighteenth centuries. Prerequisite: ARCH 413 and ARCH 414, or
equivalent as determined by the instructor.

ARCH 516  Architecture Seminar 1800-2000  credit: 3 Hours.
Seminar on topics in European and American architecture from 1800
to 2000. May be repeated in separate terms to a maximum of 12 hours.
Prerequisite: ARCH 415, ARCH 416, or ARCH 417.

ARCH 517  Architectural History 1850-Present  credit: 3 Hours.
This course is a survey of significant buildings, movements, and
figures of modern and contemporary architecture, with a focus on
contextualizing built environments as the embodiment of social, cultural,
political, economic, and technological developments of their time. It
outlines the development of modern, postmodern, and contemporary
architectural thought. Key themes include industrialization and
modernization, the development of the modern movement in twentieth-
century architecture, non-Western modernism, the development of
postmodernism as an architectural movement, regionalism, globalization
and architecture, the sustainability movement, and the development of
digital technology in architecture. 3 graduate hours. No professional
credit.

ARCH 518  Recording Historic Buildings  credit: 3 Hours.
Examines techniques for recording historic buildings and sites:
measuring, photographing, and drawing to Historic American Building
Survey standards; taking field notes and investigating public records to
document reports. Prerequisite: ARCH 419 and demonstrated ability in
architectural graphics; or consent of instructor.
ARCH 519  Conser of Building Materials  credit: 3 or 4 Hours.
Examination, analysis, and pathologies of building materials and techniques for treatment and repair of historic buildings. Emphasis is on conservation of traditional masonry, concrete, and metals. Field trips and lab work. To receive 4 hours credit, students must participate in lab. Prerequisite: ARCH 419.

ARCH 530  Management in Architecture  credit: 3 Hours.
Study of management and business administration topics relevant to the architecture profession. The application of: marketing, ethics, accounting, organizational behavior, quantitative analysis, finance, operations, economics, and strategic planning to the field of architecture. Management and economic issues that influence and motivate commercial, industrial, institutional, and individual clients are addressed. Prerequisite: Graduate standing in Architecture.

ARCH 534  Building Economics  credit: 3 Hours.
Study of factors affecting cost of building including: the building market, construction cost, estimates and cost control, time value of money and building life-cycle cost, measuring the worth of investments, depreciation and tax consideration of cash-flows. Prerequisite: Graduate standing or consent of instructor.

ARCH 536  Planning and Design of Structural Systems  credit: 4 Hours.
This course addresses the selection, planning, and preliminary design of structural systems for buildings. Emphasis is on understanding structural systems and their components as part of an integrated building system. Topics covered include a review of concepts from statics and strength of materials, structural requirements of strength-stiffness-stability, structural planning considerations, gravity loads and systems, lateral loads and systems, soils and foundations, and cable-net and other facade systems. 4 graduate hours. No professional credit. Prerequisite: ARCH 232 and ARCH 433 or consent of instructor.

ARCH 537  Environmental Control Systems II  credit: 4 Hours.
This course investigates the control of thermal and luminous environments with an emphasis on active means of controls and building envelope design. Specific topics include: heating and cooling load and energy calculations; primary (boilers, chillers, etc.) and secondary (comfort delivery) mechanical systems; indoor air quality; energy, lighting, and daylighting codes and metrics; electric lighting properties, selection, design, and calculations; advanced daylighting strategies and calculations; visual comfort assessment; curtain wall and masonry systems; and rain screen principles. 4 graduate hours. No professional credit. Prerequisite: ARCH 434 or consent of instructor.

ARCH 538  Econ Issues in Arch Develop  credit: 4 or 6 Hours.
Individual and team analysis of architectural development proposals addressing relevant economic topics and trends. Proposals are analyzed for development, construction, finance, operation, and sale costs. Potential and projected rate of return on investment is established for specific time periods. Economic and social forces impacting upon real estate values are examined. 4 or 6 graduate hours. No professional credit. Prerequisite: ARCH 501, ARCH 530, and ARCH 534; or consent of instructor.

ARCH 544  Bldg Sys & Design Integration  credit: 0 to 4 Hours.
Advanced course on building design for greater performance, including the study of: the anatomical and functional variations of building subsystems and their design implications; inter-system relationships and synergistic integration of building subsystems into the overall building; and the strategies for designing buildings of high functional performance and greater overall value. Term paper is required for 4 hours credit. Prerequisite: Graduate standing in Architecture or consent of instructor.

ARCH 545  Design & Constructability  credit: 3 or 4 Hours.
Advanced course on building design for greater constructability, including material alternatives and their architectural, performance, and construction implications; the implications of the specifics of design on the range of applicable construction methods, and therefore, on construction productivity and economy; and the strategies for designing buildings of high constructability and greater overall value. Term paper is required for 4 hours credit. Prerequisite: ARCH 544 or consent of instructor.

ARCH 546  Programming & Concept Studio  credit: 6 Hours.
An advanced course on programming architectural projects and developing design concepts to best meet the project goals and maximize value creation. Investigation of relevant issues and appropriate methods of programming and concept development are followed by programming and design exercises. The specific contents include: theories and methods of programming; general program requirements and exemplary design responses for selected major building types; testing of the viability of selected model programs through exploration of appropriate design responses; further enhancement of the subject programs in light of such explorations; and investigation and development of philosophically sound and operationally efficient methods of programming and design. May not be repeated for credit. Prerequisite: Graduate standing in architecture and consent of instructor.

ARCH 547  Architectural Practice Studio  credit: 6 Hours.
Comprehensive building design with emphasis on holistic design integration for optimum performance and constructability with best possible economy under the realistic temporal, technical, legal, and budgetary limitations. The projects, typically real ones, are executed through partial construction document phase through collaborative design by project teams. (Day-long Friday field trips). Prerequisite: ARCH 534, ARCH 545, and ARCH 546; or consent of instructor.

ARCH 548  Const Execution & Admin  credit: 4 Hours.
Advanced course in construction with emphasis on acquiring knowledge and developing skills for successful project execution in a real-time project with numerous variables affecting the project outcome, including: devising methods and strategies for effective project execution; making decisions that can steer the project to the best possible direction; and skilfully mediating disputes and conflicts that might arise. For this purpose, on-going major construction projects are used as Learning Laboratories. May be repeated to a maximum of 8 hours. (Summer I credit: 1 graduate hour and Summer II credit: 2 graduate hours). Prerequisite: ARCH 501 and ARCH 545; or consent of instructor.

ARCH 550  Reinforced Concrete Design  credit: 4 Hours.
Selection, design, and comparison of reinforced concrete floor systems for buildings; study and design of columns and footings; and prestressed concrete. Prerequisite: ARCH 452.

ARCH 551  Structural Analysis  credit: 4 Hours.
Advanced problems in the analysis of statically determinate structures; general theories and methods of analysis of statically indeterminate structures by geometric and energy methods; and introduction to theory of plastic design. Prerequisite: ARCH 451 and ARCH 452.

ARCH 552  Soil Mech and Foundations  credit: 3 Hours.
Soil properties and site exploration; stresses in soils; soil consolidation and settlement; shear strength of soils; bearing capacity; design of spread and combined footings; mats; pile foundations; lateral soil pressure and retaining walls. Prerequisite: ARCH 452 and ARCH 551.
ARCH 553  Adv Reinforced Concrete Design  credit: 3 Hours.
Critical review of the analysis, methods, and specifications involved in
the design and behavior of reinforced concrete structures for buildings,
including tall buildings, plates, and shells; computer applications.
Prerequisite: ARCH 551; credit or concurrent registration in ARCH 560 or
consent of instructor.

ARCH 554  Adv Steel Design  credit: 3 Hours.
Advanced topics in the design of steel structures; critical study of the
AISC specification; design of steel members and their connections;
composite structures; and the analysis and design of continuous
structures and tall buildings. Prerequisite: ARCH 560 or consent of
instructor.

ARCH 555  Prestressed Concrete Design  credit: 3 Hours.
Theory and design of prestressed concrete structures and suspension
shell structures. Prerequisite: ARCH 553 or consent of instructor.

ARCH 556  Advanced Structural Planning  credit: 4 Hours.
Study of the loads, functional and spatial requirements, and construction
problems in the selection and design of structural systems for buildings;
cost estimates; and integration of mechanical and electrical equipment.
Prerequisite: ARCH 552 and ARCH 553; credit or concurrent registration in
ARCH 554 and ARCH 555, or consent of instructor.

ARCH 558  Structural Wood Design  credit: 3 Hours.
Analysis and design of wood structures for buildings; response of wood
buildings to gravity and lateral loads; design of structural elements:
beams, columns, beam-columns, members in tension, and trusses using
NDS specifications; connections; plywood panels; diaphragms and shear
walls. Prerequisite: ARCH 451 or equivalent.

ARCH 559  Structural Masonry Design  credit: 3 Hours.
Engineering properties of masonry materials; codes and standards for
masonry structures; analysis and design of masonry structures including
multistory buildings and arches. Prerequisite: ARCH 452 or equivalent.

ARCH 560  Advanced Structural Analysis  credit: 3 Hours.
Advanced theory and analysis of statically indeterminate structures,
recognizing effects due to temperature, settlement, and fabrication
errors; matrix methods focusing on computer analysis techniques;
introduction to plastic analysis and design. Prerequisite: ARCH 551.

ARCH 563  Soc/Beh Research Designed Env  credit: 4 Hours.
Introduction to methods and techniques of systematically generating
social and behavioral information relevant to the programming, design,
and evaluation of physical environments. Same as LA 563. Prerequisite:
Graduate standing in architecture, landscape architecture, or urban and
regional planning.

ARCH 571  Design: Detail and Architectonics  credit: 6 Hours.
Design studio investigations of multiple techniques and methodologies
addressing the design and fabrication of small-scale architectural
constructions, explorations of specific sites and places, and
interdisciplinary projects. Field trips may be required. Shop safety
orientation required. 6 graduate hours. No professional credit. May be
repeated in separate terms to a maximum of 12 hours. Prerequisite:
Graduate standing or consent of instructor.

ARCH 572  Design: Behavior and Environment  credit: 6 Hours.
Design studio explorations responding to social, economic, political and
behavioral dimensions of human existence and settlement. Projects
investigate the experience of physical environments at the human scale
and socially sustaining design strategies addressing diverse human
needs. Field trips may be required. 6 graduate hours. No professional
credit. May be repeated in separate terms to a maximum of 12 hours. Prerequisite:
Graduate standing or consent of instructor.

ARCH 573  Design: Technology and Performance  credit: 6 Hours.
Design studio investigations of buildings and systems focusing on
structure, enclosure, technology and performance. Integration of building
materials, components and systems and their impact on the design,
construction, and sustainability of buildings. Field trips may be required.
6 graduate hours. No professional credit. May be repeated in separate
terms to a maximum of 12 credit hours. Prerequisite: Graduate standing or consent of
instructor.

ARCH 574  Design: Architecture and Urban Design  credit: 6 Hours.
Design studio investigations of issues that impact urban habitats,
buildings and people. Architecture and urban design, preservation,
and adaptation of new and existing buildings, cities, districts, public
realms and urban environments. Designing and preserving buildings
and communities in a sustainable manner. Field trips may be required.
6 graduate hours. No professional credit. May be repeated in separate
terms to a maximum of 12 credit hours. Prerequisite: Concurrent
enrollment in ARCH 536 or consent of instructor.

ARCH 575  Integrative Architecture Design Studio  credit: 6 Hours.
Schematic design and development of a public building focusing on the
integration of environmental, structural, and building envelope systems,
while also addressing issues of accessibility, life safety, environmental
stewardship, and site conditions. Field trips may be required. 6 graduate
hours. No professional credit. Prerequisite: ARCH 536 and ARCH 537.

ARCH 576  Architectural Design Seminar  credit: 3 Hours.
Presentations and discussions relative to various areas of architectural
and environmental design concerns. May be repeated to a maximum of
15 hours. Prerequisite: Consent of instructor.

ARCH 577  Theories of Architecture  credit: 4 Hours.
Review of principles of architectural design; factors in programming
architectural requirements; design development; and evaluation and
criticism. 4 graduate hours. No professional credit. Prerequisite:
ARCH 517 or consent of instructor.

ARCH 589  PhD Colloquium  credit: 1 Hour.
Provides graduate students insight on the responsibilities and
expectations of academic faculty. Core responsibilities - research,
teaching and service - required of faculty will be discussed, along with
important resources and strategies to aid students in obtaining a faculty
appointment and plotting a successful career path. Approved for S/U
grading only. Must be repeated in separate terms to a maximum of
2 hours.

ARCH 590  Directed Research  credit: 0 to 8 Hours.
Nature and scope of projects to be determined by consultation between
student and faculty advisor; open to architecture and landscape
architecture majors as well as those from other disciplines who wish
to engage in interdisciplinary work. Approved for both letter and S/
U grading. May be repeated in the same term up to 12 hours and
separate terms up to 18 hours; MARCH students are limited to 12 hours.
Prerequisite: Consent of instructor.

ARCH 591  Spec Prob Arch Hist & Pres  credit: 2 to 4 Hours.
Individual investigation of the work of particular architects, of specific
buildings, and of the architecture of periods or regions; comparative
studies; and aesthetic problems. May be repeated in separate terms to a
maximum of 12 hours. Prerequisite: Twelve hours of architectural history
or consent of instructor.
ARCH 593  Spec Prob Arch Practice & Mgt  credit: 2 to 4 Hours.
In-depth investigation of emerging issues and specific areas of research interest beyond what is covered in graduate courses of regular offering in the area of architectural practice and management. Students, as individuals or in groups, are expected to propose a research plan and methods for a specific topic of research interest in consultation with the instructor, and execute it under the guidance of the instructor through consultation on a regular basis. May be repeated in same and subsequent terms as topics vary to a maximum of 12 hours. Prerequisite: Advanced graduate standing and consent of instructor.

ARCH 594  Spec Prob Building Sci & Tech  credit: 2 to 4 Hours.
In-depth investigation of emerging issues and specific areas of research interest beyond what is covered in graduate courses of regular offering in the area of building science technology. Students, as individuals or in groups, are expected to propose a research plan and methods for a specific topic of research interest in consultation with the instructor, and execute it under the guidance of the instructor through consultation on a regular basis. May be repeated to a maximum of 12 hours. (Summer credit: 1 to 2 graduate hours). Prerequisite: Advanced graduate standing and consent of instructor.

ARCH 595  Spec Prob Struct Theory & Des  credit: 2 to 4 Hours.
Individual or group investigation and study in architectural engineering application; research in economy and design in correlation with architectural, mechanical, and structural requirements. May be repeated to a maximum of 12 hours. Prerequisite: Consent of instructor.

ARCH 596  Spec Prob Housing Env  credit: 2 to 4 Hours.
Individual investigation or research in housing environments involving special issues such as energy conscious design, human-environmental relations, aesthetic theory, government policy, and cultural patterns. May be repeated to a maximum of 12 hours. Prerequisite: Consent of instructor.

ARCH 597  Spec Prob Arch Design  credit: 2 to 4 Hours.
Individual investigation of building types and systems, aesthetic theories, design thesis programming and other problems in architectural design. May be repeated to a maximum of 16 hours. Prerequisite: Consent of instructor.

ARCH 598  Specialized Architectural Practice  credit: 0 Hours.
This course adds an academic dimension to professionally supervised field experiences in which problems in architectural design and technology are defined, researched, and solved. Advanced doctoral students are introduced to applied research processes in any of architecture's sub-disciplines. Sites of applied research may include commercial firms, not-for-profit organizations, and government agencies. Students work in school-approved firms or agencies of their choice. Written accounts of work accomplished, documentation of research questions developed and pursued, and reflective experiential learning reports must be submitted for evaluation. Field experiences may be part time or full time. 0 graduate hours. No professional credit. Approved for S/U grading only. May be repeated for up to 11 months total of training. This course is intended to facilitate CPT in professionally focused environmental design research for students in the PhD program. Prerequisite: Required research methods course (ARCH 505/LA 505 or ARCH 563/LA 563 or equivalent) and approval of both PhD program chair and student's PhD adviser. For PhD students who have completed stage 1 of coursework.

ARCH 599  Thesis Research  credit: 0 to 16 Hours.
Approved for S/U grading only. May be repeated to a maximum of 16 hours. Prerequisite: Consent of instructor and graduate program coordinator.