

# ARCH - ARCHITECTURE (ARCH)

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## ARCH 105 Design and Visual Communications Foundations I

**Credits 5. 2 Lecture Hours. 10 Lab Hours.** Architectural design principles; development of skills in perception, thought and craft as they apply to the formation of two- and three-dimensional relationships; introduction to and practice of tools, methods, techniques available for graphic communication; graphic communication and the design process; observation and other forms of free-hand drawing and drawing systems that develop representational and descriptive capabilities. **Prerequisites:** BS in Architecture major.

## ARCH 106 Design and Visual Communication Foundations II

**Credits 5. 2 Lecture Hours. 10 Lab Hours.** Approaches to problem identification and problem solving emphasizing human, physical and cultural factors influencing architectural design; understanding of space, materiality and tectonics in a human body scale; development of drawing methods with emphasis on analytical drawing; reinforcement of visual and verbal communication as applied to design processes. **Prerequisites:** Grade of C or better in ARCH 105; major in BS in Architecture.

## ARCH 115 Visual Communication Foundations I

**Credits 3. 3 Lecture Hours. 0 Lab Hours.** Introduction to and practice of tools, methods, techniques available for graphic communication; graphic communication and the design process; observation and other forms of free-hand drawing and drawing systems that develop representational and descriptive capabilities.

## ARCH 205 Architecture Design I

**Credits 5. 2 Lecture Hours. 10 Lab Hours.** Issues and methods in designing environments for human habitation and well-being; projects addressing site, functional planning, spatial ordering, form generation through a recognition of the synthesis of space, structure, use and context; reinforcement of appropriate graphic and model building techniques. **Prerequisites:** Grade of C or better in ARCH 105 and ARCH 106.

## ARCH 206 Architecture Design II

**Credits 5. 2 Lecture Hours. 10 Lab Hours.** Fundamental issues of innovative design processes and creation explored through the creative use of past, present and future materials, tools, and technologies; with an emphasis upon the research of materials, methods, scale, craft and technique as instruments of design, fabrication, and production. **Prerequisites:** Grade of C or better in ARCH 205.

## ARCH 212 Social and Behavioral Factors in Design

**Credits 3. 3 Lecture Hours.** Social and behavioral factors in the built and natural environment; environmental perception and spatial cognition; social-environmental processes such as privacy and crowding; setting-oriented discussion on residences, education, and the workplace; the psychology of nature and natural resource management; social design and social science contribution to architectural design.

## ARCH 213 Sustainable Architecture

**Credits 3. 3 Lecture Hours.** A comprehensive introduction to sustainability concepts, techniques and applications at all levels of the built environment, history of contemporary development of sustainable architecture from 1960 to the present; design strategies, environmental technologies and social factors for reducing building energy needs and carbon foot prints; global applications of sustainable approaches.

## ARCH 216 Computational Methods in Architecture

**Credits 3. 2 Lecture Hours. 2 Lab Hours.** Software and processes for computation design in architecture; image editing and creation, vector drawing, 3D modeling, parametric modeling, rendering techniques and simulation.

## ARCH 221/MUST 221 Foundations of Museum Studies

**Credits 3. 3 Lecture Hours.** Introduction to museums, cultural heritage and collections care; best practices for non-profit institutions, public engagement and the collection, preservation and exhibition of material culture; emphasis on archaeological, ethnographic, and historical collections, or other collections of cultural significance. **Cross Listing:** MUST 221/ARCH 221.

## ARCH 246 Foundations of Historic Preservation

**Credits 3. 3 Lecture Hours.** Exploration and evaluation of the cross-disciplinary work of historic preservation; emphasis on the significance of historic places to societal well-being and conservation alternatives for historic and cultural environments; review of preservation projects and treatments; guest presentations and case studies from practicing professionals and researchers in a variety of fields.

## ARCH 249 Survey of World Architecture History I

**Credits 3. 3 Lecture Hours.** (ARCH 1301) Survey of World Architecture History I. A survey of world architecture and the human-designed and built environment from prehistory to the 13th century.

## ARCH 250 Survey of World Architecture History II

**Credits 3. 3 Lecture Hours.** (ARCH 1302) Survey of World Architecture History II. A survey of world architecture and the human-designed and built environment from the 13th to the 19th century.

## ARCH 260 Comparative Theory in the Built and Virtual Environments

**Credits 3. 3 Lecture Hours.** Introduction of cultural theory and the environment; theories, special concepts and ideas relevant to the built and virtual environments with primary focus on the last fifty years; theory, theory building, and application to buildings and urban design; formation of ideas and critical ways of assessing the environment.

## ARCH 281 Seminar in Contemporary Architecture

**Credit 1. 1 Lecture Hour.** Presentations by and discussions with professionals representing specialty areas related to environmental design through the Department of Architecture Lecture Series. May be taken four times for credit. Must be taken on a satisfactory/unsatisfactory basis.

## ARCH 291 Research in Architecture Innovation

**Credits 0 to 4. 0 to 4 Other Hours.** Research conducted under the direction of faculty member in the College of Architecture. May be repeated 2 times for credit. **Prerequisite:** Approval of instructor and department head.

## ARCH 305 Architecture Design III

**Credits 5. 2 Lecture Hours. 10 Lab Hours.** Integration of architectural theories and philosophy with environmental design systems; study of theoretical approaches to graphic and analytical thinking, problem identification and design dissemination through various media, case studies and problem resolution; conditions and forces associated with a variety of building types and the generation design solutions. **Prerequisites:** Admission to upper level in BS in Architecture; ARCH 249 and ARCH 250.

## ARCH 317 Digital Fabrication for Architecture

**Credits 3. 1 Lecture Hour. 4 Lab Hours.** Digital fabrication for architecture including software, numerically controlled tools, translation applications and management strategies for digital fabrication workflows; production of building components from three dimensional datasets of virtual architecture proposals. **Prerequisites:** Junior or senior classification or approval of instructor; ARCH 216 or approval of instructor.

## ARCH 327 Conceptual Structural Analysis

**Credits 3. 1 Lecture Hour. 4 Lab Hours.** A non-mathematical investigation of structural systems and components with respect to behavior; selection of the most appropriate structural system for various building typologies. **Prerequisite:** Junior or senior classification or approval of instructor.

## ARCH 328 Architectural Envelopes

**Credits 3. 3 Lecture Hours.** Study of roof, wall, glazing and screen systems of significant works in contemporary architecture and the strategies behind their making; focus on innovative materials, surface effects, and performance aspects. **Prerequisite:** Junior or senior classification in environmental design.

## ARCH 330 The Making of Architecture

**Credits 3. 3 Lecture Hours.** Study of significant works of contemporary architecture and materials and strategies used in their making; focus on innovative materials, systems, and partnerships necessary to realize the design. **Prerequisites:** Junior or senior classification in environmental design or approval of instructor or ARCH classification.

## ARCH 331 Architectural Structures

**Credits 3. 2 Lecture Hours. 2 Lab Hours.** Physical principles that govern statics and strength of materials through the design of architectural structures from a holistic view, in the context of architectural ideas and examples; introduction to construction, behavior of materials, and design considerations for simple and complex structural assemblies; computer applications. **Prerequisites:** Junior or senior classification in environmental design; MATH 142 or equivalent; PHYS 201.

## ARCH 335 Architectural Systems

**Credits 3. 2 Lecture Hours. 2 Lab Hours.** Theory and applications of building energy use, envelope design, shading analysis, heating and cooling systems, lighting design; building water supply, plumbing and drainage systems; electrical, acoustical, fire and lightning protection; life safety; transportation systems and construction materials; calculations, equipment selection, and component sizing as they relate to building design. **Prerequisites:** Junior or senior classification in environmental design; PHYS 201.

## ARCH 345 History of Building Technology

**Credits 3. 3 Lecture Hours.** Chronological development of civilization and building technology from prehistoric cultures to present; classic and modern materials, structural devices past and present, machine-produced products, prefabrication, construction methodology and servicing.

## ARCH 346 Architecture, Heritage and Culture

**Credits 3. 3 Lecture Hours.** Global exploration of how architecture and the built environment express culture and identity; theoretical and practical approaches to cultural heritage and conservation. **Prerequisite:** Junior or senior classification.

## ARCH 347 Documentation of Historic Buildings and Sites

**Credits 3. 1 Lecture Hour. 4 Lab Hours.** Techniques for recording historic buildings and sites; measuring and drawing to Historic American Building Survey Standards; field experience in photography, laser scanning, photogrammetry, hand measuring, field notes and record drawing preparation. **Prerequisites:** Junior or senior classification or approval of instructor.

## ARCH 350 History and Theory of Modern and Contemporary Architecture

**Credits 3. 3 Lecture Hours.** Development of modern and contemporary architecture in the 20th and 21st centuries; materials, structure, social and economic changes as well as architectural theory. **Prerequisites:** Junior or senior classification.

## ARCH 353 History of Product Design

**Credits 3. 3 Lecture Hours.** History of product design in Europe and America including the relationship between designer and object, the relationship of design, industry and media over time and design criticism; focus on material/technical and typological approaches, comparative method and content analysis in context of original environment and social history. **Prerequisite:** Junior or senior classification or approval of instructor.

## ARCH 360 Topics in Design Build Community Service

**Credits 3. 1 Lecture Hour. 4 Lab Hours.** Contemporary topics in architectural design-build practices including high impact interdisciplinary learning experiences developed through a project-based learning model with a focus on the planning, design, pre-construction, construction and project delivery; team-based approach with those outside of the architecture discipline to design, plan and complete project documents, estimates and undertake the construction activities necessary to make a fully functioning community service project.

**Prerequisites:** Junior or senior classification or approval of instructor.

## ARCH 381 Design Seminar

**Credit 1. 1 Lecture Hour.** Presentations by and discussions with professionals representing specialty areas related to architectural fabrication and product design. May be taken three times for credit.

**Prerequisite:** Junior or senior classification or approval of instructor.

## ARCH 401 Design Creativity

**Credits 3. 3 Lecture Hours.** Fundamental critical and creative thinking skills needed to participate in and create the future; study of how design can impact the physical environment and society. **Prerequisites:** Junior or senior classification or approval of instructor.

## ARCH 405 Architecture Design IV

**Credits 6. 2 Lecture Hours. 12 Lab Hours.** A comprehensive design studio focused on the integration of design theory with functionally sustainable environmental and structural systems; consideration of a project from site analysis and programming through design detailing. **Prerequisites:** ARCH 305, ARCH 331, ARCH 335; CARC 301 or ARCH 494; concurrent enrollment in ARCH 431 and ARCH 435.

## ARCH 406 Architecture Design V

**Credits 5. 2 Lecture Hours. 10 Lab Hours.** Topical approaches to design, emphasizing theory and practice of architecture or related disciplines, such as urban design, interior design, health care design, etc. **Prerequisites:** Junior or senior classification; admission to upper level in BS in Architecture; grade of C or better in ARCH 305, ARCH 331 and ARCH 335; grade of C or better in CARC 301 or ARCH 494; students may with approval of the department enroll in the course during the summer term prior to taking ARCH 405, ARCH 431 and ARCH 435 if they are within 20 credit hours of graduation prior to the beginning of the following fall semester.

## ARCH 413 Elements of Urban Design

**Credits 3. 3 Lecture Hours.** Investigation of design elements shaping the urban environment; emphasis placed on contemporary precedents in architecture, landscape and urbanism to evaluate design complexity on multiple levels: social, political, environmental, economic, cultural and geographic. **Prerequisite:** Admission to upper level division in BED or BS-URPN.

## ARCH 421 Energy and Sustainable Architecture

**Credits 3. 3 Lecture Hours.** Understanding the various design decisions impacting sustainability and energy efficiency; includes participation in an "academic" LEED-NC rating project; interdisciplinary team approach with a design studio architect to perform the LEED-NC rating on the architect's building; application of reference material, standards, and USGBC material. **Prerequisite:** Junior and senior classification or approval of instructor.

## ARCH 430 History of Ancient Architecture in the Near East, Egypt, Greece and Rome

**Credits 3. 3 Lecture Hours.** Examination of stylistic, structural and theoretical advancements in ancient architecture, with case studies from the Near East, Egypt, Greece and Rome. **Prerequisite:** ARCH 249 or ARTS 149; junior or senior classification or approval of degree coordinator or instructor.

## ARCH 431 Integrated Structures

**Credits 2. 1 Lecture Hour. 2 Lab Hours.** Selection and economics of structural systems in the context of integrating structural systems into a building through good design; analysis and design of wood, steel, concrete, and composite systems and members in relation to building design. **Prerequisites:** Admission to upper level in environmental design; ARCH 305, ARCH 331, ARCH 335; concurrent enrollment in ARCH 405 and ARCH 435.

## ARCH 433 Architectural Lighting

**Credits 3. 3 Lecture Hours.** Theory and practice of lighting design as an art and science; aperture design for sunlight control; selecting and locating luminaries to enhance interior and exterior surfaces and spaces. **Prerequisite:** ARCH 335 or junior or senior classification in EDAS.

## ARCH 434 The Role of Sculpture and Painting in Ancient Architecture

**Credits 3. 3 Lecture Hours.** Interrelationships of architecture, painting and sculpture in the ancient world including Egypt, Mesopotamia, Crete, Greece and Rome. **Prerequisite:** ARCH 249 or ARTS 149; junior or senior classification or approval of degree coordinator or instructor.

## ARCH 435 Integrated Systems

**Credits 2. 1 Lecture Hour. 2 Lab Hours.** Understanding how to integrate sustainable environmental systems into a building through good design; lectures support studio; systems faculty participate in studio critiques throughout the project. **Prerequisites:** Admission to upper level in environmental design; ARCH 305, ARCH 331, ARCH 335; concurrent enrollment in ARCH 405 and ARCH 431.

## ARCH 437 The Gothic Cathedral

**Credits 3. 3 Lecture Hours.** A critical study of monumental church-building in Europe during the later Middle Ages (ca. 1140–1500 C.E.); investigation of works of architecture, sculpture and painting in relation to issues of craft, ritual and power; exploration of the afterlives of the Gothic style in the Americas, Asia and Africa. **Prerequisite:** ARCH 250 or ARTS 150; junior or senior classification or approval of degree coordinator or instructor.

## ARCH 438 World Religious Architecture

**Credits 3. 3 Lecture Hours.** Exploration of the diverse architectural traditions of the world's major religions with an emphasis on issues of place-making, representation, ritual, identity, and culture, past and present. **Prerequisite:** Junior or senior classification.

## ARCH 441 Baroque and Rococo Architecture

**Credits 3. 3 Lecture Hours.** The investigation of the history of architecture, the arts and society, and major creative individuals from the late sixteenth to the early eighteenth centuries. **Prerequisite:** ARCH 250 or ARTS 150; junior or senior classification or approval of degree coordinator or instructor.

## ARCH 443 Aegean Art and Architecture

**Credits 3. 3 Lecture Hours.** Art and architecture of the prehistoric Aegean, ca. 6000-1100-B.C.E.; focus on the built environment, material culture and visual arts of early civilization in the Aegean basin; evidence for regional and vernacular architectural traditions; expressions of power, ideology and social identity through monumental architectural and elite arts of Minoan Crete and Mycenaean Greece. **Prerequisites:** Junior or senior classification; approval of instructor or degree coordinator.

## ARCH 444 American Architecture

**Credits 3. 3 Lecture Hours.** Investigation of indigenous, vernacular and historical American architecture from 1500 to 1920; evolution of construction technologies, changing building forms and finish treatments; identification of historic architectural styles and their influence on 21st century American architecture. **Prerequisites:** ARCH 250 or ARCH 350; junior or senior classification, or approval of instructor.

## ARCH 451 Strategies in Architectural Management

**Credits 3. 3 Lecture Hours.** Emerging strategies in the architecture and construction industry, with an emphasis on understanding the changing structure of the industry and the management of both firms and projects. **Prerequisite:** Senior classification or approval of degree coordinator.

## ARCH 452 Careers in Architecture

**Credits 3. 3 Lecture Hours.** Career opportunities in the profession of architecture; investigations into the composition of architectural practice today and the wide range of specialties represented in architectural firms; interviews with select representative individuals. **Prerequisite:** Admission to upper level in environmental design, construction science or landscape architecture.

## ARCH 457 Ethics and Professional Practice

**Credits 3. 3 Lecture Hours.** Issues and relationships within the business, legal and political environment; introduction to the concepts of architectural specifications and the AIA standard conditions of the construction contract; forms of construction, bidding and contract documents. For undergraduate students pursuing a professional degree and a career in architecture. **Prerequisite:** Senior classification in environmental design.

## ARCH 458 Cultural and Ethical Considerations for Global Practice

**Credits 3. 3 Lecture Hours.** Issues and relationships within the cultural, business, legal and political environments of global practice; differences in the construction contract, bidding and various forms of construction. **Prerequisite:** Junior or senior classification.

## ARCH 463 Elements of Interior Architecture

**Credits 3. 3 Lecture Hours.** Analysis and design of architectural interiors; historical and professional perspectives incorporating programming, space planning and organization; specification and selection of furnishings and materials to satisfy user needs in residential, commercial and institutional settings. **Prerequisites:** Admission to upper level in environmental design; concurrent enrollment in ARCH 405, ARCH 431 and ARCH 435 not allowed.

## ARCH 468 Preservation Field Studies

**Credits 1 to 6. 1 to 6 Other Hours.** Fieldwork related to practice of historic preservation and cultural heritage management; methods of documentation, analysis, planning and treatment; emphasis on identification and evaluation of multidisciplinary approaches to historic preservation and heritage conservation in global contexts; topics vary each semester. May be taken for credit up to six hours. **Prerequisites:** ARCH 246, ARCH 346, or ARCH 347; junior or senior classification or approval of instructor.

## ARCH 481 Seminar

**Credit 1. 1 Lecture Hour.** Presentations by and discussions with professionals representing specialty areas related to environmental design; career and academic objectives. May be repeated for up to 4 credit hours. Must be taken on a satisfactory/unsatisfactory basis. **Prerequisite:** Junior or senior classification or approval of instructor.

## ARCH 484 Summer Internship

**Credits 6. 12 Other Hours.** Practical experience in an office of design allied professionals; 10-week internship with a minimum of 400 hours continuous employment; departmental pre-approval through the departmental internship coordinator required; post evaluation conducted following the internship. May not be repeated for credit. **Prerequisites:** Junior or senior classification or approval of instructor; approval of the environmental design internship coordinator.

## ARCH 485 Directed Studies

**Credits 1 to 5. 1 to 5 Other Hours.** Special projects in architecture. May be repeated for credit. **Prerequisites:** Admission to upper level in environmental design; approval of instructor and degree coordinator.

## ARCH 489 Special Topics in...

**Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours.** Special topics in an identified area of architecture. May be repeated for credit. **Prerequisite:** Junior or senior classification; approval of instructor and degree coordinator.

## ARCH 491 Advanced Architecture Innovation Research

**Credits 0 to 6. 0 to 6 Other Hours.** Research conducted under the direction of faculty member in the College of Architecture. May be repeated 2 times for credit. **Prerequisite:** Admission to upper level in environmental design; approval of instructor and department head.

## ARCH 494 Internship

**Credits 9. 18 Other Hours.** Practical experience in an office of design allied professionals; fifteen week internship with a minimum of 600 hours of continuous employment; departmental pre-approval through the departmental internship coordinator required; post evaluation conducted following the internship. To be taken only as a requirement for the study away semester. May not be repeated for credit. **Prerequisites:** Junior or senior classification; admission to upper level in environmental design; CARC 481; approval of the environmental design internship coordinator.