Architecture (ARC)

ARC 140  Experiencing Architecture  (3 credit hours)
An introductory course intended to provide non-majors with a foundation in the basic concepts of architecture. Provides a general understanding of contemporary issues and theory in architecture, concerns about green architecture and sustainability, architecture practice and the role architecture plays in the design of cities.

GEP Visual and Performing Arts
Typically offered in Spring and Summer

ARC 141  Introduction to Architectural History  (3 credit hours)
World architectural history of sacred and secular buildings and buildings with emphasis before the modern era. For non-Architecture majors only. Does not count toward Architecture degrees.

GEP Global Knowledge, GEP Visual and Performing Arts
Typically offered in Fall and Spring

ARC 162  An Introduction to Architecture  (3 credit hours)
The purpose of architecture examined through its practices, theories and key principles. Lectures, projects, and readings expose students to the diverse world of ideas, creative work and practical considerations which make up the discipline of architecture.

Prerequisite: D 104 and BED-A students; Corequisite: D 105
Typically offered in Spring only

ARC 201  Architectural Design: Environment  (6 credit hours)
Investigation of the relationships between environment and built form. Solar orientation, topography, vegetation, and constructed context in relationship to user needs as parameters for justifying design proposals. Particular emphasis on architectural conventions of communication.

Prerequisite: D 105; BED-A students only; Corequisite: ARC 211
Typically offered in Fall only

ARC 202  Architectural Design: Form  (6 credit hours)
Investigation of relationships between idea and form. Composition and precedent as parameters for generating, developing, and justifying architectural form. Particular emphasis on electronic media in drawing and modeling.

Prerequisite: ARC 201 and BED-A students
Typically offered in Spring only

ARC 211  Natural Systems and Architecture  (3 credit hours)
Restricted to students in BEDA Program. Relationship between natural and architectural systems. Exploration of the implications of natural forces - sun, wind and daylight- on architecture. Energy-conscious architectural design and site planning strategies to fulfill thermal comfort requirements of people in designed environments.

Prerequisite: D 105
Typically offered in Fall only

ARC 232  Structures and Materials  (3 credit hours)
An introduction to construction materials and building structures. Explorations of materials' properties, aesthetics, environmental impact, and performance. Quantitative and qualitative analysis of structural building elements. Course integrates lecture and laboratory. Off-campus field trips are included (students may need to coordinate transportation).

Typically offered in Spring only

ARC 241  History of World Architecture  (3 credit hours)
History of the built environment (buildings, urban planning, and associated arts) in western and non-western cultures, ranging from dawn of civilization to dawn of modern era, including high-style architecture, vernacular buildings, and traditional forms.

Typically offered in Fall only

ARC 242  History of Western Architecture  (3 credit hours)
History of western architecture (including some landscape architecture and city planning) from the beginnings of the Renaissance in early 15th century to late 19th century in the United States.

Prerequisite: ARC 241 or Consent of Instructor
Typically offered in Spring only

ARC 251  Digital Representation  (3 credit hours)
Project based methodological investigation of digital representation in architecture including: two- three- and four-dimensional media. Purchase of laptop and necessary software required.

Prerequisite: BED-A students or Master of Arch, Track 3 students
Typically offered in Spring only

ARC 289  Architectural Travel Study I  (3 credit hours)
The study of cities, architectural sites, buildings, building complexes, and architectural elements conducted independently by students as part of a planned travel-study tour. Includes advance research and approval of proposed study topic and itinerary. Students will document study through sketches, analytical notations, and a summary paper. Departmental Approval Required

Prerequisite: ARC 141 and ARC 142
Typically offered in Fall and Spring

ARC 292  Special Topics in Architecture  (1-3 credit hours)
Topics of current interest in Architecture. Normally used to develop new courses.

Typically offered in Fall, Spring, and Summer

ARC 301  Architectural Design: Tectonics  (6 credit hours)
An introduction to the fundamentals of building systems on architectural design. Emphases on building assemblages, vertical-load structural systems, circulation, and passive heating, cooling, and ventilation. Particular emphasis on physical models. Limited to BED-A Students. Junior Standing. Students are required to purchase project materials.

Prerequisite: ARC 202 and ARC 211 and ARC 232; Corequisite: ARC 331 and ARC 432
Typically offered in Fall only

ARC 302  Architectural Design: Technology  (6 credit hours)
An investigation of building technical systems as fundamental elements of the design process with emphasis on lateral load resisting structural strategies, environmental control/energy, enclosure assembly detail, and their architectural implications. Particular emphasis on physical models. Restricted to BED-A students, Junior standing. Students are required to purchase materials for projects.

Prerequisite: ARC 301 and ARC 331 and ARC 432
Typically offered in Spring only
Typically offered in Spring only

**Requisite:** ARC 251

**Prerequisite:** Masters of Architecture Track 3 students; ARC 403; Co-modeling.

Architectural form. Particular emphasis on electronic media in drawing and precedent as parameters for generating, developing, and justifying investigating relationships between idea and form. Composition and architectural function in shaping the form of the building. Interaction of flexural elements. Design and sizing of joints.

**Typically offered in Spring only**

**ARC 405 Architectural Design Fundamentals: Technology** (6 credit hours)

An introductory architectural design studio for M. Arch. Track 3 students in which the technical systems of building - structure, environmental control/energy, materials, enclosure, and circulation; their fabrication and assembly; and their capacity to affect form and tectonic expression - are explored as fundamental elements of the design process. Particular emphasis on physical models.

**Prerequisite:** Master of Architecture students; ARC 404; Co-requisite: ARC 331 and ARC 432

Typically offered in Fall only

**ARC 414 Environmental Control Systems** (3 credit hours)

Studies in light, heat, moisture, air motion, and sound in architectural environments. Mechanical, electrical and/or electronic equipment for illumination, heating, cooling, ventilation, vertical transportation and communication in buildings. Water and waste, fire protection and safety, and acoustic systems in architecture.

**Prerequisite:** ARC 211

Typically offered in Spring only

**ARC 432 Architectural Construction Systems** (3 credit hours)

Building construction systems related to architectural design. Historical and current building practices. Implications for design and systems selection. Case studies. Field trips are required.

**Prerequisite:** ARC 232

Typically offered in Fall only

**ARC 441 History of Contemporary Architecture** (3 credit hours)

A survey and critical examination of modern architecture from its origins in 19th-century philosophy and technology to the most recent developments in world architecture.

**Prerequisite:** ARC 241, ARC 242; BED-A students, Bachelor of Architecture students, or Masters of Architecture students

Typically offered in Fall only

**ARC 442 History of NC Architecture** (3 credit hours)

Survey of NC Architecture from 17th-century settlement to World War II. Coverage of a wide range of building types and development patterns.

**Prerequisite:** ARC 241, ARC 242

**ARC 450 Architectural Drawing** (3 credit hours)

Introduction to hand drawing skills, techniques, and concepts necessary to use drawing for visual thinking (and visual communication) particularly in the development of design ideas and understanding of architecture. Restricted to Masters of Architecture Track III students.

Corequisite: ARC 451

**Typically offered in Summer only**

**ARC 451 Digital Drawing and Modeling** (3 credit hours)

Introductory course to digital communication tools as an integral part of the architectural design process. This course challenges students to develop diverse two and three-dimensional drawing and modeling skills through project-based exercises that engage various digital visualization and layout software. Purchase of laptop and necessary software required. Summer 5 week course. Restricted to Master of Architecture, Track III students.

**Co-requisite:** ARC 450

**Typically offered in Spring and Summer**
Typically offered in Fall, Spring, and Summer

Prerequisite: Graduate standing

Course topics typically explore aspects of building design, urban design, and community design in a comprehensive and integrative manner. 

**ARC 500 Architectural Design: Professional Studio** (6 credit hours)
A comprehensive and integrative architectural design studio for M.Arch students involving the execution of a project in sufficient depth to understand the opportunities and discipline resulting from the inclusion of building.

Prerequisite: M.Arch Track 1 and Track 2 student, ARC 405 or BEDA Degree (or equivalent)
Typically offered in Fall and Spring

**ARC 501 Professional Architecture Studio I** (6 credit hours)
Design studio investigations aimed at the development of an understanding of the major issues confronting the contemporary architect and at the expanding of problem solving abilities in architectural design.

Prerequisite: BEDA degree
Typically offered in Fall only

**ARC 502 Professional Architecture Studio II** (6 credit hours)
Design investigation aimed at the development of an understanding of the major issues confronting the contemporary architect and at the expanding of problem solving abilities in architectural design. This is an individualized, final project studio.

Prerequisite: ARC 501
Typically offered in Spring only

**ARC 503 Advanced Architectural Design (Series)** (6 credit hours)
Advanced studies in architectural design. Projects concerning various aspects of building design, urban design, and community design in comprehensive and integrative manner.

Prerequisite: Graduate standing
Typically offered in Fall, Spring, and Summer

**ARC 520 Sustainable Architecture** (3 credit hours)
This survey course provides students with a solid knowledge base in the numerous aspects of sustainable design touching not only upon strategies, but also various philosophies behind sustainability and the green building movement. This course examines the impact of the built environment on natural systems and questions what it truly means to build responsibly. Lectures, discussions, guest speakers, and field trips create a critical foundation for green building considerations to be references in design at a variety of scales. Restricted to M. Arch, B. Arch, and BEDA seniors. Non-architecture majors by instructor's permission.

Architecture or Environmental Design in Architecture Majors Only
Typically offered in Summer only

**ARC 521 Daylighting and Passive Energy Systems for Architecture** (3 credit hours)
An investigation of building energy systems and simulation techniques with emphases on thermal envelope, solar geometry, daylighting, passive heating & cooling, and building systems integration. The theoretical considerations will be accompanied by hands-on exercises using various simulation tools. Restricted to M.Arch, B.Arch, and BEDA Senior Students. Non-Architecture majors by instructor's permission.

Typically offered in Fall only

**ARC 522 Building Energy Efficiency & Renewable Energy** (3 credit hours)
This course will discuss and develop strategies for the design of sustainable buildings. The two primary topics addressed are: 1) energy efficiency and 2) renewable energy. The students will learn and discuss ways to improve energy efficiency in buildings. The renewable energy technologies, such as solar and geothermal, are explored to discuss the applicability of those in the building design.

Typically offered in Fall only

**ARC 523 Building Energy Modeling and Simulation** (3 credit hours)
This course deals with the fundamentals of building sciences in terms of energy systems. Energy modeling and simulation technologies are used to predict and analyze the energy performance of buildings. The students calculate the energy consumption of heating, cooling, lighting, and equipment by hand to understand the energy & thermal behavior of buildings and then compare and analyze them with those calculated by energy modeling and simulation programs.

Prerequisite: ARC 414
Typically offered in Fall only

**ARC 524 Building Energy Optimization** (3 credit hours)
This course introduces energy optimization technologies in buildings using computer simulation. The EnergyPlus program, a whole-building computational energy simulation tool developed by USDOE, is used. The maximum energy savings potential of Energy Efficiency Measures (EEMs) are identified and implemented for the energy optimization process. Students obtain a great deal of information about a building’s potential for energy savings, well before the first brick is even laid.

Prerequisite: ARC 523
Typically offered in Spring only
ARC 525 Sustainability Over the Life of a Building (3 credit hours)  
Focuses on strategies and metrics for “greening” existing buildings. Sustainability over the Life of a Building will explore the criteria and documentation needed to certify a building at NC State in the LEED for Existing Buildings: Operations and Maintenance (EBOM) rating system. This course will emphasize the importance of interdisciplinary work while working toward sustainability goals. Over the course of the semester, students will research various criteria and thresholds for the LEED EBOM system. Through this in-depth process, students will synthesize core knowledge about LEED credits to better understand opportunities for strategies in green buildings. Over the course of the semester, students will research various criteria in-depth which are needed for LEED Existing Building Certification, not only becoming familiar with the rating system itself, but also the foundation for each of the addressed LEED credits, as well as context for decisions made in the realm of green buildings.  
This is a graduate-level seminar open to all NCSU master’s degree students but can be open to advanced standing undergraduate students with instructors’ approval. No prerequisites.  
Typically offered in Fall only

ARC 526 Health and Sustainability in the Built Environment (3 credit hours)  
Explores opportunities in the design and aligned fields for facilitating higher sustainability and health targets, associated thresholds, and certification achievements in the built environment. Building rating systems are reviewed that address categories such as social equity, carbon neutrality, material toxicity, nourishment, fitness, mind, justness, and more. Reaching beyond the standards of current green building practice and public policy, the class will explore methods and case studies using cutting-edge building certification frameworks to target carbon neutral, net-zero, and health-promotive design. Student teams will be working on specific projects with professional firms for their final projects.  
This is a graduate-level seminar open to all NCSU master’s degree students but can be open to advanced standing undergraduate students with instructors’ approval. No prerequisites.  
Typically offered in Spring only

ARC 530 Tectonics and Craft (3 credit hours)  
Studies of construction and material form in architecture. Case studies of select examples of contemporary architecture that exemplify the technique and craft of modern construction. Analysis of functional, tectonic, and experiential aspects of building methods within the context of economics and culture. Examination of assembly as a determinant of building form.  
Prerequisite: Architecture Majors, ARC 432  
Typically offered in Fall only

ARC 534 Design of Architectural Details (3 credit hours)  
Using detail patterns based on function, constructability, and aesthetics, students analyze existing successful building details, diagnose problems in existing buildings, and design details for their own projects. Restricted to Bachelors and Masters students in Architecture.  
Typically offered in Spring only

ARC 535 Experiments in Architecture Prototypes (3 credit hours)  
Examination of significant architecture prototypes of the Modern Movement. Seminar will investigate the effectiveness of prototypes in proposing solutions to technological, social, and environmental issues such as housing, education, and sustainability. Students will explore the possibilities of prototype design and construction in contemporary practice. Field trips required.  
Prerequisite:ARC 232 or equivalent  
Typically offered in Summer only

ARC 536 Materials for Design (3 credit hours)  
Contemporary buildings that have insightfully integrated design intention and materials are analyzed using the case study method. Each student uses an iterative analytical process to probe deeply and specifically to find each building’s key lessons regarding materials. Key drawings and photographs will be graphically presented, with a narrative summarizing findings regarding the project’s general design intentions and its technical embodiment. Restricted to M. Arch or B. Arch Students.  
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Typically offered in Fall only

ARC 537 Digital Materials Translations (3 credit hours)  
This seminar combines architectural material research with instruction in advanced digital design software. Students will examine specific materials to determine attributes, and then use parametric, NURBS-based software, and CNC machinery to propose new material applications. The course is limited to College of Design students unless instructors grant permission.  
Prerequisite: (ARC 251 or ARC 451 or equivalent) and (ARC 232 or equivalent)  
Typically offered in Fall only

ARC 538 Manufacturing Architecture (3 credit hours)  
Focuses on customized repetitive manufacturing for architecture components. Specifically includes repetitive processes that make repeated uses of tooling (e.g. molds, patterns, or jigs) to form components. We will investigate repetitive manufacturing processes and architectural case studies. Limited to MArch, BArch, and BED-A students, senior standing.  
Prerequisite: Architecture Majors, ARC 432  
Typically offered in Fall only

ARC 540 Architectural Theory (3 credit hours)  
This course provides an introduction to the major themes and associated figures of architectural theory. It focuses on 20th and 21st century texts with a particular emphasis on historicism, phenomenology, structuralism and post-structuralism. Each week there is assigned reading from a range of texts, including extra-disciplinary writers. Lectures and discussions serve to identify principal themes, connect to contemporary issues, and establish relevancy to architectural design. Restricted to M. Arch, B. Arch, and BEDA Seniors. Non-architecture majors by instructor’s permission.  
Typically offered in Spring only
ARC 541 Architecture, Culture, and Meaning (3 credit hours)
This course focuses on architecture as a cultural artifact and provides an overview of the interrelationship of architectural form, organization, symbolism, use and meaning. A broad range of examples from a variety of cultures, religions, and historical periods are covered (including "non-Western"), illustrated by detailed case studies. Syncretic, holistic and homological approaches to understanding the meaning and significance of architecture are emphasized. Phenomenological and hermeneutical methods of interpretation are introduced and pertinent philosophical traditions discussed. Restricted to M.Arch., B.Arch., and BEDA seniors. Non-architecture majors by instructor's permission.

Typically offered in Fall only

ARC 542 Sacred Architecture (3 credit hours)
This course focuses on the meaning and cultural significance of sacred architecture, including its environmental and socio-political contexts, and doctrinal and liturgical influences. The course is structured according to the world's principal faiths and presented comparatively and holistically. There is a particular emphasis on the communicative roles of architecture and the symbolism and ritual use of sacred places. Contemporary theoretical methodologies are introduced and applied as means establish relevancy to contemporary issues and architectural design. Restricted to graduate students.

Typically offered in Fall only

ARC 543 Analysis of Precedent (3 credit hours)
Investigation of architectural elements, relationships and ordering ideas through comparative graphic analysis of buildings designed by architects. Emphasis on buildings as physical artifacts.

Prerequisite: Grad. standing

Typically offered in Spring only

ARC 544 American City Planning History (3 credit hours)
An examination of the history of American cities, their founding, plans, and development with emphasis on the colonial era to the late 19th century. Broad study of the larger historical trends in city planning balanced by readings focused on major cities (New York, Chicago, Los Angeles) and smaller ones (Savannah, New Orleans). Major issues include street patterns, parks, and public buildings and spaces; and the roles of government and private citizen groups. Restricted to graduate students in the MArch, seniors in the BArch, and seniors in the BEDA programs; or by permission of the instructor.

Prerequisite: ARC 241 and ARC 242 and ARC 441 or permission of instructor.

Typically offered in Fall only

ARC 545 Methods of Interpretation in Architectural History (3 credit hours)
This seminar surveys the materials, methods, and texts of architectural history as an analytical discipline of the built environment. A broad selection of readings will trace the evolution of the discipline and will position architectural history in relation to such fields as architecture, art history, urban and social history, anthropology, literature, cultural studies, urban planning, and architectural theory. The course is restricted to graduate students and serves as one of the alternate required courses for the Concentration in the History and Theory of Architecture.

P: ARC 241 and ARC 242 and ARC

Typically offered in Fall only

ARC 546 Theory of Building Types (3 credit hours)
Theoretical implications and practical applications of typology in architecture. Analysis and documentation of selected building types in their historical evolution. Graphic identification of type characteristics.

Prerequisite: Two ARC studios

Typically offered in Fall only

ARC 548 Vernacular Architecture (3 credit hours)
Readings in theories of vernacular architecture. Case studies of selected examples of vernacular architecture of the world: architectural analysis of utilitarian, tectonic, and perceptual aspects of buildings and urban fabrics against the background of place and culture. Examination of influences of various vernacular traditions on contemporary practice.

Prerequisite: M.Arch student without an undergraduate degree in architecture must have completed ARC 211, ARC 241, ARC 232

Typically offered in Spring only

ARC 561 The Practice of Architecture (3 credit hours)
A lecture course examination of the practice of architecture through a lecture course, with emphasis upon both normative and emerging procedures in the private architectural firm. Special attention upon the role and function of the practicing architect, legal and regulatory conditions, the nature of professional services, office management and project management processes.

Typically offered in Fall and Spring

ARC 562 Legal Issues in Architecture (3 credit hours)
The main principles of law affecting the profession of architecture as it is influenced by contracts, torts, agency, property, and environmental restrictions.

Prerequisite: Architecture Majors, ARC 561

Typically offered in Fall only

ARC 563 Public Interest Design Seminar: Case Studies and Current Issues (3 credit hours)
This course evaluates and appraises design in the public interest as a critical and growing element of design disciplines. We explore how design can positively contribute to the social, economic, and environmental well-being of US and global communities. We study current innovations and review successful examples of projects and practice. In addition to lectures by the professor, presentations are made by professionals and experts in public interest design.

The class is open to Architecture Graduate Students in the College of Design. Other NCSU students may enroll by permission of Instructor.

Typically offered in Spring only

ARC 570 Anatomy of the City (3 credit hours)
A morphological investigation of cities throughout urban history, with emphasis on formal principles of spatial organization. Part one: examination of the descriptive properties of cities in terms of interdisciplinary concepts and principles. Part two: examination of the organizational characteristics of urban space.

Typically offered in Fall only
ARC 571 Urban House (3 credit hours)
This seminar is intended to investigate the interrelationships between the form of housing and the demands of a rapidly changing society. Reference is made to the physical, economic, social, cultural, and economic factors that influence housing design.

Prerequisite: Graduate standing
Typically offered in Spring only

ARC 572 Regional Infrastructures (3 credit hours)
This seminar provides students with a solid knowledge base about current urban issues and design theory surrounding the contemporary networked metropolis. Through lectures, discussions, and workshops the course examines how infrastructural systems might be expanded in order to catalyze additional environmental, social, and economic processes. Students research specific infrastructural systems (conducting food, water, or energy) at a systems-defined regional scale to better understand the characteristics of 21st century American cities and speculate on new opportunities for architects and landscape architects to practice. Restricted to M. Arch, B. Arch, BEDA seniors, and M. LArch.

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Typically offered in Spring only

ARC 574 Place and Place Making (3 credit hours)
Examination of the definitions, concepts and emergent research findings useful in explaining the human sense of place through seminar-lecture course. Particular emphasis upon those physical aspects and relationships influencing this sense of place and affording some designer control.

Prerequisite: Graduate standing
Typically offered in Fall only

ARC 576 Community Design (3 credit hours)
Processes through which citizens shape and manage built environment. Strategic planning, visioning process, community action, and mediation will be discussed and illustrated with case study examples from architecture, landscape architecture and planning. Analysis and assessment from case studies of participation techniques such as charrette, study circles, and visual appraisal.

Typically offered in Fall only

ARC 577 Sustainable Communities (3 credit hours)

Typically offered in Fall only

ARC 581 Project Preparation Seminar (3 credit hours)
Quantitative and qualitative conditions, considerations and determinants as preparation for architectural design. Emphasis on research methods, data collection and interpretation, theoretical discourse, site analysis, programming and architectural precedent. Required enrollment in B.Arch.

Typically offered in Fall only

ARC 589 Architectural Travel Study II (3 credit hours)
Independent study while traveling. Submission of sketchbook/journal and paper upon return. Research on topic of concentration and approval of itinerary in advance required. Graphic documentation and critical evaluation of buildings and urban spaces.Requ

Typically offered in Fall, Spring, and Summer

ARC 590 Special Topics in Architecture (1-6 credit hours)
Topics of current interest by faculty in the Department of Architecture. Subjects under this number normally to test and develop new courses.

Prerequisite: Graduate standing
Typically offered in Fall and Spring

ARC 598 Final Project Studio In Architecture (6 credit hours)
Final project for graduate students supervised by members of their graduate advisory committee. Requires department approval.

Prerequisite: 18 hrs. of ARC 503 and ARC 697
Typically offered in Fall and Spring

ARC 610 Special Topics in Architecture (1-6 credit hours)
Special Topics in Architecture

ARC 630 Independent Study (1-3 credit hours)
Development of research and projects in various aspects of architecture under the direction of architecture faculty member on tutorial basis. Requires a faculty sponsor and departmental approval.

Prerequisite: Graduate standing
Typically offered in Fall, Spring, and Summer

ARC 685 Supervised Teaching (1-3 credit hours)
Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.

Prerequisite: Master's student
Typically offered in Fall, Spring only

ARC 688 Non-Thesis Masters Continuous Registration - Half Time Registration (1 credit hours)
For students in non-thesis master's programs who have completed all credit hour requirements for their degree but need to maintain half-time continuous registration to complete incomplete grades, projects, final master's exam, etc.

Prerequisite: Master's student
Typically offered in Fall and Spring

ARC 689 Non-Thesis Master Continuous Registration - Full Time Registration (3 credit hours)
For students in non-thesis master's programs who have completed all credit hour requirements for their degree but need to maintain full-time continuous registration to complete incomplete grades, projects, final master's exam, etc. Students may register for this course a maximum of one semester.

Prerequisite: Master's student
Typically offered in Fall and Spring

ARC 696 Summer Thesis Res (1 credit hours)

ARC 697 Final Project Research in Architecture (1-6 credit hours)
Investigation of selected problems and projects in architecture of particular interest to graduate students under the direction of a faculty member on a tutorial basis. Credits and content vary to meet the scope of the project proposal.

Prerequisite: Graduate standing
Typically offered in Fall and Spring

ARC 896 Summer Dissert Res (1 credit hours)