



DEPARTMENT OF ARCHITECTURE AND URBAN SUSTAINABILITY

COURSE DESCRIPTIONS:

ARCHITECTURE AND COMMUNITY PLANNING (ARCP) & (ARAC)

ARCP 101 Basic Design and Communication (4)

Are you interested in learning how designers communicate their ideas through sketches and formal drawings? Do you wonder about how drawings relay the message of what you are visualizing in your mind? Do you wonder how famous architects related their theories about the built environment? This course will introduce you to all of this and more. You will learn sketching techniques; formal drawing and drafting techniques; and how to communicate your ideas through architectural working drawings.

ARCP 102 Basic Design and Communication II (4)

Prerequisite: ARCP101. Were you intrigued by the ideas and concepts learned in ARCP101? Then you are ready for this course. You will continue to develop skill in graphic communication and drafting. You will get a further understanding of the role of detailing in representing solutions to construction problems related to light construction. A scale model will be constructed as part of this course.

ARCP 105 Introduction to Computer Technology I (3)

In this course, you will learn how to use SketchUp and Revit, and other types of drawing and rendering tools that help you visualize and present your ideas. In the process you will learn how building components come together into a building envelope.

ARCP 106 Introduction to Computer Tech II (3)

Prerequisite: ARCP105. This course is a continuation of ARCP105, with a more detailed exploration of Revit as a tool for building information modeling (BIM). The student will learn to develop 3D model representations of how building components interface with each other as well as how Revit interfaces with other programs, including AutoCAD. Students will learn about importing/exporting and manipulating other files with Revit.

ARCP 115 Materials & Methods of Construction I (3)

Do you wonder how so many different materials come together to form a building? Are you curious about how it is that a tree becomes the wood used for building a house? Would you like to understand how various materials are stacked, glued, screwed and nailed together to make the interior of a building dry and warm when the outdoors is wet and cold? If you are wondering about any of these things this class is designed to help you solve the mystery. You will learn how wood, masonry, cement and more come together in a building. You will also learn many of the words, phrases, and names used to describe the building and building process.

ARCP 116 Materials & Methods of Construction II (3)

Prerequisite: ARCP115. Did you learn about the materials and the varied uses of them in a building? Are you intrigued by how cement turns to concrete? Are you curious about the process by which bricks, or concrete blocks are made? Are you curious about how green architecture and sustainable construction affects the environment and the building's life span? These and many other concepts will be explored in this course. Field trips to various sites will be undertaken to get a firsthand understanding of how materials are used in construction. At the end of this class you will be conversant in the language used in the building industry to describe process, methods and material use. Lecture 2 Hours; Lab 3 Hours.

ARCP 123 Architecture and Planning Graphics (3)

How do you convince the viewer through drawings and models that a scene is real? This is the question that will be explored in this first year first semester. The course is intended to prepare the students to use the graphic language for communicating ideas in architecture and planning. Students learn the formal drawing conventions utilized by architects to include axonometric, orthographic projection, and perspective drawings and other foundational graphic techniques and principles for conveying ideas.

ARCP 201 Architectural Studio I (4)

This is a continuation of ARCP102 Basic Design and Communication II. The student will learn the graphic skills needed to organize and develop a set of 'working' drawings and the communication skills to present it.

ARCP 202 Architectural Studio II (4)

Prerequisite: ARCP201. By the end of the semester the student will learn how to develop 'working' drawings. As a part of this development the student will learn how the zoning and building codes inform the production of a building. The product is a set of construction document drawings that accounts for code, structure and construction rules and good practice.

ARCP 206 CAD Documentation, Specifications, and Estimating (3)

Prerequisite: ARCP106, ARCP201. This course develops the student's skill in construction document coordination detailing; discipline's coordination; specification writing and cost estimating. Students are expected to have a general/overview knowledge of AutoCAD, and a detailed knowledge of Revit, and how they form the basis for preparing construction documents and building information management (BIM) systems.

ARCP 231 Statics and Structural Design (3)

This elective course studies the concepts of stresses and strength of materials; moment, shear, equilibrium, inertia, static loading versus dynamic loading, and torque. This course allows the student to develop the necessary skills to understand the primary elements of load calculation, load transfer, and load tables.

ARCP 241: Advanced Computer Simulation (3)

Prerequisite: ARCP106. This course will explore the CADD program as a presentation tool. The integration of the 3D software output with software for enhancing the visual presentation objects will be learned. The student will be expected to understand and develop skills in the following areas: Solid Modeling, Animation, and Orthographic drawing presentation.

ARCP 244 Environmental Systems I (3)

In this course you will learn how plumbing systems are designed to manage waste disposal from the building; how power is supplied and controlled in a building envelope; and how illumination elements are designed to minimize environmental effects.

ARCP 246 Environmental Systems II (3)

Prerequisite: ARCP244. This course will focus on Heating, Air Conditioning, Ventilation and Conservation of Energy. The student will learn methods of load calculations done manually, using tables to calculate heat transfer coefficients for any type of construction, determine temperature differences required by codes or by good practice, compute the size of equipment, piping and ducts which will be appropriate to the building type and use and available fuels. Simple residences or small commercial buildings will be analyzed for HVAC systems and plans will be prepared to guide the contractor for installation.

ARCP 256 Built Environment (3)

This course provides a holistic introductory treatment of architecture and the built environment for architecture and non-architecture majors. The emphasis is on the examination of world-wide cultural belief systems and other factors that have had a major impact on the man-built world. The organized design professions are reviewed, and their value systems examined. The course also exposes the student to the issues of sustainability and climate change, and the role those factors are playing.

ARCP 301 Architectural Studio III (5)

Prerequisite: ARCP202. This course builds on the first two years of technical design studios. Are you interested in a more in-depth analysis process for arriving at a solution for a building design? How does the designer decide on which is the best plan layout and three-dimensional shape of a building? This course will offer challenging design problems crafted to expose the student to the design analysis process used to study design situation in the urban context. The application of zoning and building codes to the building outcome is expected.

ARCP 302 Architectural Studio IV (5)

Prerequisite: ARCP301. The analysis process will be applied in the development of a design concept. The students are expected to learn how to integrate the various disciplines that affect the shape, form and structure of the building. Life safety issues and the architectural responses will be learned and applied to given design problems. Students are expected to understand how the structural systems are applied in the context of the given building type.

ARCP 321 History & Theory of Architecture (3)

Have you ever wondered why the National Cathedral, or the Basilica at Catholic University looks the way it does? Have you wondered how the pyramids were built? These and many other questions about the influences of people their actions and choices on the built environment will be discussed in this course. The development of shelter, architectural space and sacred places from prehistoric times to the Gothic Cathedrals will be explored, along with cultural, economic, technological, and political influences on construction and design.

ARCP 322 History & Theory of Architecture II (3) (this course is taught online)

Prerequisite: ARCP321. This course will study the built environment; the design of buildings and spaces from the Gothic Period through modern times. The development of the major schools of architectural thought will be explored. The shaping of the built environment by technology will be explored. The student will learn how the major design philosophies and schools of thought influenced our modern-day treatment of the built environment.

ARCP 331: Theory of Structures (3)

Prerequisite: PHYS102/104. Analysis of statically determinate beams and trusses, methods of determining deflection of structures, influence lines and application for moving loads and indeterminate structures including continuous beams and frames are pursued. The course presents the classical methods of structural analysis needed to analyze statically determinate and indeterminate structures. It aims at providing the necessary analysis foundation for the design courses that typically follow this course in the traditional architectural engineering curriculum.

ARCP 332 Design of Steel Structures (3)

Prerequisite: ARCP331. This course reviews the concepts of stresses and strength of materials: moment, shear, equilibrium, inertia, static loading versus dynamic loading, and torque. This course allows the student to develop the necessary skills to understand the primary elements of load calculation, load transfer, and load tables as it relates to steel construction and specifically steel frame construction. The AISC codes are employed in computations.

ARCP 401 Architectural Studio V (5)

Prerequisite: ARCP302. This studio is a continuation of Laboratory IV with the emphasis shifting to the cost and time management control aspects of building design and production. The student will undertake two architectural designs of mid-size building types on primarily urban sites located in the Washington, D.C. metropolitan area. The architectural design problems will be set to assure that the student reaches a basic level of competence in addressing the problems associated with architecture within an urban context. The two projects will vary in time and scope.

ARCP 402 Architectural Studio VI (5)

Prerequisite: ARCP401. This course is the culmination of architectural design studio course sequence in the Bachelor of Science in Architecture Degree program. The student is expected to demonstrate a firm grasp of the skills required for undertaking comprehensive, sustainable and inclusive building design. The

communication and illustration of the design solution is of paramount importance in demonstrating the acquisition of design skills. The semester is devoted to the undertaking of an urban-scale design project with minimum faculty supervision.

ARCP 411 Professional Ethics & Practice (3)

This course undertakes a general review of: the profession of Architecture; historic developments; relation to other professions and disciplines; the changing role of the Architect; architectural and related professional societies; state and national registration boards; education accreditation; federal, state and municipal agencies and legal and ethical questions relating to the practice of architecture and emerging forms of practice.

ARCP 412 Preservation Rehabilitation Tech I (3)

The course utilizes the Secretary of the Interior's Certification application, preservation guidelines and technical specifications as the base of case study analysis of the planning and design of historic structures in Washington, D. C. Non-historic rehabilitation techniques in housing, cost control and recycle/retrofit techniques for various structures are also analyzed through community planning.

ARCP 432 Design of Concrete Structures (3)

Prerequisite: ARCP331, ARCP 332. The Design of Concrete Structures covers the analysis and design of reinforced concrete rectangular and T-beams, one-way slabs, short and slender (long) columns, spread footings, and wall footings. The concepts of stresses and strength of materials: moments, shear, equilibrium, inertia, static loading versus dynamic loading and torque are reviewed. This course allows the student to develop the necessary skills to understand the primary elements of load calculation, load transfer, and load tables as it relates to concrete and concrete frames. The ACI codes are employed in computations.

ARCP 501 Professional Studio Lab VII (5)

Co-requisite: ARCP521. This course is the final guided design studio of the architecture program curriculum and serves as the design portion of the curriculum on integrated practice. The course provides hands-on experience and seeks to prepare students for the self-guided thesis project, as well as working in a professional office. The course also provides critical preparation for professional licensure. The student undertakes the design of a substantive building project in this semester with special attention to sustainability and building technology. Concurrent coursework in ARCP521 Architectural Systems & Environment completes the technical, systems, documentation and financial portions of the project.

NOTE: Students without prior exposure to REVIT are strongly advised to enroll concurrently (or audit ARCP595: Computer Tech- Revit)

ARCP 502 Thesis Studio I (5)

Prerequisites: ARCP501, ARCP507. This course is the first part of an integrated and largely self-guided two-semester studio sequence in the Master of Architecture degree program. Work completed in thesis course, along with the Graduate Seminar, is the foundation for the capstone thesis project. Students will program, research, and design a project of their choosing as a means of demonstrating the knowledge acquired in

previous semesters or select a theoretical problem. Basic competency in BIM/CAD/ computer graphic skills is required. The semester is devoted to making significant progress on the design statement envisioned in the pre-design/research document prepared in ARCP507 Graduate Seminar during the preceding semester.

ARCP 503 Urban and Community Design I (3)

This class is intended to promote understanding of public space and public life through readings and discussions in urban design and planning through observation and analysis of urban conditions in Washington, D.C. Students will learn the practical tools of urban design as well as graphic communication techniques. Student will expand and refine their skills using spatial analysis via drawing and diagramming urban conditions.

ARCP 504 Urban and Community Design II (4)

Prerequisite: ARCP503. This elective class is intended to delve deeper into understanding how public space and public life come about through readings and discussions in urban design and planning through observation and analysis of urban conditions in Washington, D.C. Field trips to local sites will be included in the in-depth study of the urban landscape. Students are expected to have a grasp of the practical tools of urban design illustration as well as graphic communication techniques. Student will be expected to be able to communicate their ideas using spatial analysis via drawing and diagramming urban conditions.

ARCP 505 Sustainable Design I (3) (this course is taught online)

Buildings account for approximately 50-60% of the energy usage in the United States. What can be done to make buildings more energy efficient? This course will introduce students to the USGBC LEED rating system, as well as other programs, which facilitates the design, review, and maintenance of new and existing buildings through the incorporation of "green" technologies. Students will examine the benefits of designing sustainable buildings and understand the process involved in achieving LEED certification.

ARCP 506 Sustainable Design II (3)

Prerequisite: ARCP-505. How does the design process change when designing energy efficient buildings? Does applying LEED credits to a building change the shape of the final design? Using the LEED program, students will design an energy efficient building. Sustainable design technologies will be reviewed and applied to an actual building via a design studio program. Lectures will examine other aspects of sustainability that do not include building design and discuss how students can apply sustainable practices to their own lives.

ARCP 507 Graduate Thesis Seminar (3)

Successful completion of this course is the prerequisite for enrollment in the spring semester ARCP 502 Thesis Studio. Graduate school level scholarly writing proficiency and research skills are required. Extensive critical reading and written reviews occur, along with a review of research methodologies. The student selects a master's thesis topic in consultation with the course instructor; develops the research protocol; documentation; pre-design program and problem statement. The approved document is the basis for ARCP 502 Thesis Studio I.

ARCP 514 Professional Ethics & Practices II (3)

This course focuses, via the case study method, on the business and financial tools of professional practice including real estate development and other emerging entrepreneur opportunities. The student is expected to understand the ethics associated with the practice of Architecture of Architecture as a business and profession that is responsible for health safety and welfare of the public.

ARCP 516 Adv. Topics in Preservation Rehabilitation Technology I (4)

This elective course utilizes the Secretary of the Interior's Certification application, preservation guidelines and technical specification as the base of case study analysis of the planning and design of historic structures in Washington, D.C. Non-historic rehabilitation techniques in housing, cost control and recycle/retrofit techniques for various structures also are analyzed through community planning.

ARCP 520 Architectural Design Theory (3)

Have you ever wondered how architects come up with their design ideas? What determines the aesthetics of a project? How do existing structures – both historic and contemporary – influence the design of a project? How does context impact the design? What other ordering systems guide the final design of a building? This class will explore the theory underlying many design principles and provide the student with a strong foundation to enhance the knowledge gained in the history class.

ARCP 521 Architectural Systems & Environment (3)

Co-requisite ARCP501. This course complements the design studio and provides the students with a detailed background on the criteria, including financial criteria, by which an architect selects all the building service systems and materials appropriate for a complex building. Students will review and expand on previous courses related to thermal transfer, environmental conditions, lighting, plumbing, electrical, communication, vertical transportation, security, and fire protection systems. The course also provides critical preparation for professional licensure. Concurrent coursework in ARCP501 will provide the design project for which the student will research and create the technical documentation.

ARCP 550 Thesis Studio II (1-5)

Prerequisites: ARCP502, ARCP507. This course is the final part of an integrated and largely self-guided two-semester studio sequence in the Master of Architecture degree program. Work completed in this course, along with ARCP507 and ARCP502, results in the capstone thesis project. Students will refine and complete the documentation for the program, research, and design of the project of their choosing envisioned in the previous courses of the sequence or address a theoretical problem. In doing so, the student will demonstrate the ability to synthesize and apply the knowledge acquired in previous semesters.

The following courses are designed for students who have a non-architecture degree and wish to pursue architecture at the graduate level.

ARAC 601: Design Studio I (4)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-101 and ARCP-102. This course covers principles and theory of drawing types and techniques of three-dimensional modeling. The SketchUp software program will be used in developing three-dimensional visualization skills. Because a building will be produced the student will also learn about building components and how they come together to construct a building. Since design involves the bringing together of a group of activities into one envelope, the student will learn the fundamentals of design analysis. How to present your work in the architectural graphic language will also be studied. Mastering the vocabulary related to light frame construction is expected. Scale models will be constructed. Lecture 2 hours, laboratory 3 hours.

ARAC 602: Design Studio II (4)

Prerequisite: ARAC-601. This course is for graduate students who need to catch up on fundamental skills covered in ARCP-201 and ARCP-202. By the end of the semester the student will learn how to develop 'working' drawings. As a part of this development the student will learn how the zoning and building codes inform the production of a building. The product is a set of construction document drawings that accounts for code, structure and construction rules and good practice.

ARAC 603: Design Studio III (5)

Prerequisite: ARAC-602. This is a continuation of ARAC-602. This course is for graduate students who need to catch up on fundamental skills covered in ARCP-301 and ARCP-302. It offers challenging design problems crafted to expose the student to the design analysis process used to study design situations in the urban context. The application of zoning and building codes to the building outcome is expected. Students are expected to learn how to integrate the various disciplines that affect the shape, form and structure of the building. Students learn about architectural responses to life safety issues and apply them to design problems. Students learn how the structural systems are applied in the context of the given building type.

ARAC 604: Design Studio IV (5)

Prerequisite: ARAC-603. This is a continuation of ARAC-603. This course is for graduate students who need to catch up on fundamental skills covered in ARCP-401 and ARCP-402. The student is expected to demonstrate firm grasp of the skills required undertaking comprehensive, sustainable and inclusive building design. The communication and illustration of the design solution is of paramount importance in demonstrating the acquisition of design skills. The semester is devoted to the undertaking of an urban-scale design project with minimum faculty supervision.

ARAC 605: Building Information Modeling I (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-105 and ARCP-106. Are you wondering how the computer is used in design and the exploration of idea? What does CADD mean? If you are curious about these questions and have many more about AutoCAD and SketchUp in this class, you will learn how to use these and other types of drawing and rendering tools that help you visualize and present your ideas. In the process you will learn how building components come together into a building envelope.

ARAC 615: Materials & Methods Studies (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-115 and ARCP-116. The course teaches students one of the most critical skills required to practice architecture – understand the detailing and assembly of building materials. Students learn how wood, masonry, cement

and more come together in a building; how green architecture and sustainable construction affects the environment and the building's life span; and the details of what makes a well-designed building. Lecture 2 Hours; Lab 3 Hours.

ARAC 621: History & Theory of Architecture (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-322. The student is expected to independently review the material covered in ARCP-321. The development of shelter, architectural space and sacred places from prehistoric times to the Gothic Cathedrals will be explored. The influences of economics, politics, culture, technology and philosophy shaping the built environment throughout thousands of years of human civilization will be explored.

ARAC 623: Design Communication Graphics (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-123. The course is intended to prepare the students to use the graphic language for communicating ideas in architecture and planning. Students learn the formal drawing conventions utilized by architects to include axonometric, orthographic projection, and perspective drawings and other foundational graphic techniques and principles for conveying ideas. Methods of hand drawings and computer-generated drawings will be used to explore formal drawing, drafting and rendering systems and techniques as they relate to the conventions used to represent space and objects.

ARAC 631: Statics & Structural Design (3)

This elective course is for graduate students who need to catch up on fundamental skills covered in ARCP-231. The course provides the student with skills necessary to understand the primary elements of structural systems load calculations, load transfer, and load tables. The student shall become familiar with light frame, heavy timber, light steel, and concrete systems and calculating wood, steel and concrete beams and columns and concrete slabs.

ARAC 634: Design of Concrete Structures (3)

Prerequisite: ARAC-633, ARAC 632. This course is for graduate students who need to catch up on fundamental skills covered in ARCP-432. The Design of Concrete Structures covers the analysis and design of reinforced concrete rectangular and T-beams, one-way slabs, short and slender (long) columns, spread footings, and wall footings. The concepts of stresses and strength of materials: moments, shear, equilibrium, inertia, static loading versus dynamic loading and torque are reviewed. This course allows the student to develop the necessary skills to understand the primary elements of load calculation, load transfer, and load tables as it relates to concrete and concrete frames. The ACI codes are employed in computations.

ARAC 633: Theory of Structures (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-331. Analysis of statically determinate beams and trusses, methods of determining deflection of structures, influence lines and application for moving loads and indeterminate structures including continuous beams and frames are pursued. The course presents the classical methods of structural analysis needed to analyze statically determinate and indeterminate structures. It aims at providing the necessary analysis foundation for the design courses that typically follow this course in the traditional architectural engineering curriculum.

ARAC 632: Design of Steel Structures (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-332. Prerequisite: ARAC-633. This course reviews the concepts of stresses and strength of materials: moment,

shear, equilibrium, inertia, static loading versus dynamic loading, and torque. This course allows the student to develop the necessary skills to understand the primary elements of load calculation, load transfer, and load tables as it relates to steel construction and specifically steel frame construction. The AISC codes are employed in computations.

ARAC 641: Computer Simulation & Graphics (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP 241. This course will explore the CADD program as a presentation tool. The integration of the 3D software output with software for enhancing the visual presentation objects will be learned. The student will be expected to understand and develop skills in the following areas: Solid Modeling, Animation, and Orthographic drawing presentation.

ARAC 646: Environmental Studies (3)

This course is for graduate students who need to catch up on fundamental skills covered in ARCP-244 and ARCP-246. This course focuses on Heating, Air Conditioning, Ventilation and Conservation of Energy. The student will learn methods of load calculations done manually, using tables to calculate heat transfer coefficients for any type of construction, determine temperature differences required by codes or by good practice, compute the size of equipment, piping and ducts which will be appropriate to the building type and use and available fuels. Simple residences or small commercial buildings will be analyzed for HVAC systems and plans will be prepared to guide the contractor for installation. Specifications for the work will be studied and written. Costs of fuels will be compared to optimize selection. Energy recovery and conservation will be practiced in the system designs.