SPRING 2024 ELECTIVES

TECHNICAL ELECTIVES

ARCH 301 - DIGITAL MODELING & FABRICATION. 3 credits, 3 contact hours. (3;0;0).

Instructor: Danny Salamoun
Prerequisites: ARCH 156. The seminar in Digital Modeling and Fabrication is a 3-credit course for upper level students exploring advanced 3-dimensional computer modeling techniques and data export for assembly and fabrication to various computer numerically controlled (CNC) hardware available at the School of Architecture. Specifically, students engage in NURBS and solid modeling using Rhinoceros 3D and export data through various Rhino plug-ins including RhinoCAM, which writes G- and M- Codes for 2 and 3D milling operations. CNC hardware available as of Spring 2010 includes two (2) Universal Laser Cutters, each with 18" x 32" beds; two (2) Z-Corporation Z-310 3 dimensional printers; and a Precix 9100 Industrial CNC Router with a 48" x 96" bed. Students model and fabricate full scale assemblies individually and in teams and contribute to a final exhibition of student work. Familiarity with various software tools available at the College of Architecture and Design is encouraged but not required. Admission to the course to students in their second year of study by discretion of the instructor.

ARCH 317 - ADVANCED ARCH GRAPHICS. 3 credits, 3 contact hours. (3;0;0).

Instructor: Cleve Harp
Prerequisites: ARCH 296 or ARCH 264. Gives students advanced techniques for architectural expression in traditional media. A basic knowledge of drawing methods, media, materials and projection techniques is assumed.

ARCH 361 - ADAPTIVE PARADIGMS IN ARCHITECTURE. 3 credits, 3 contact hours. (3;0;0).

Instructor: Vera Parlac
Prerequisites: ARCH 224. The course will focus on theories behind kinetic, responsive, and adaptive architecture. It will examine architecture in relation to the latest research in biology, material science, embedded systems, soft robotics, synthetic biology, bioengineering, and will address possible shifts in imagining and re-envisioning materialization of architecture. The course will underline architecture’s inseparable link to technology and speculate on new possibilities for architecture as an integrated, responsive, adaptive, and productive participant within larger ecologies.

ARCH 337/662 - BUILDING INFORMATION MODELING. 3 credits, 3 contact hours. (3;0;0).

Instructor: Brandon Warshofsky
Prerequisites: ARCH 156. This course explores both technical and philosophical approaches to the use of the computer in architectural analysis, design development, information management, and document
delivery. Autodesk Building Systems and Autodesk Revit Building will be used for 3D modeling and 2D documentation employing a systems-approach framework for spatial allocation, energy analysis, and structural considerations. The workings of the foundational information databases of the respective software will be thoroughly explored. Project requirements will include building program resolution, solar analysis, asset scheduling, document layout, and design visualization. Proficiency with Autodesk Autocad (2D) and understanding of general CAD principles are required prerequisites.

ARCH 429 - ADVANCED STRUCTURES. 3 credits, 3 contact hours. (3;0;0).
Instructor: Rima Taher
Prerequisite: ARCH 304. This course covers advanced topics in structural analysis, design of reinforced concrete structures, design of steel connections, in addition to some topics in masonry structures. The course also includes design examples in relation to various types of foundation systems. It focuses on indeterminate structures in structural analysis and integrated structural systems in designing structures. Case studies of some well-known buildings are covered. Some BIM applications with computerized calculations are included.

ARCH 483/625 - ST: PASSIVE HOUSE AND BEYOND. 3 credits, 3 contact hours. (3;0;0).
Instructor: Harrington/Padget
This course explores leading edge green building programs designed for highly efficient buildings and regenerative design, including Passive House, Living Building Challenge, and Enterprise Green Communities Certification Plus. Each program’s requirements and application for single family, multifamily and commercial building typologies will be investigated through in-depth case studies and presentations. A cross-program comparison will analyze overlaps, gaps, strengths and weaknesses of the programs - and challenge students to discern where their own sustainability values lie.

ARCH 483/649 - ST: LIFE SAFETY ISSUES IN CONTEMPORARY BUILDINGS. 3 credits, 3 contact hours. (3;0;0).
Instructor: TBD Judy Chōi
Restriction: completion of core sequence. A variety of life safety and comfort situations are studied in different building types. Topics include building evacuation, compartmentalizing, firefighting and suppression, evaluation and testing of new building materials and systems, systems control and management. Special attention is placed on multi-use, high-density buildings.

ARCH 483/654 - ST: LAND REMEDIATION AND COMMUNITY REVITALIZATION. 3 credits, 3 contact hours. (3;0;0).
Instructor: Colette Santasieri
This course introduces students to the process of transforming legacy industrial and vacant commercial
properties into community assets. Viewing land remediation and redevelopment through the lens of the triple bottom line, the students will explore ways in which transformation of these properties can improve environmental conditions, catalyze economic development, and create more socially equitable and resilient communities. Students will interact with local government officials, real estate developers, environmental consultants, attorneys, and community planners. Course topics will include: environmental laws and regulations, real estate development, cleaning up contaminated properties, community engagement, environmental justice, gentrification, and transformative land uses.

ARCH483/689 - ST: AI / VR IN ARCHITECTURE. 3 credits, 3 contact hours. (3;0;0).

Instructor: Taro Narahara
The recent progress in data science allows us to understand the correlations between artistic expressions and their implicit qualities in more quantifiable formats and leads us to explore creativity through a symbiotic relationship between human and machine intelligence. This course will introduce various analytical means to assess the performance and quality of spatial designs. Using various computational design tools, students will use environmental to aesthetic parameters to explore the use of Artificial Intelligence (AI) and Virtual Reality (VR).

ARCH 483/662 - ST: ARTIFICIAL INTELLIGENCE IN ARCHITECTURE 3 credits, 3 contact hours. (3;0;0).

Instructor: Branko Kolarevic
Recent advances in artificial intelligence (AI) offer new ways for architects to approach design projects by enabling them to generate new ideas, optimize design solutions, and enhance the overall quality of their work. This course will explore how various AI tools can augment the design processes, from conceptual design and ambiental simulation to performance prediction, by integrating cutting-edge technology such as text-to-image (T2I) generators, machine learning (ML), and natural language processing (NLP).

ARCH 537 - CABLE AND TENSION STRUCTURES. 3 credits, 3 contact hours. (3;0;0).

Instructor: Rima Taher
Prerequisites: ARCH 304 or ARCH 329. The course covers the structural technology, history and design considerations of cable-suspended, cable-stayed, tensioned fabric and air-supported structures, and the use of light-tensile structures in architecture. The course also offers an overview of the engineering standards that provide guidelines and recommendations for their design. A long list of well-known cable and tensioned fabric structures will be used to illustrate the structural design concepts. The examples focus mainly on buildings and roof structures. The tensioned fabric roof examples include some of the impressive projects of Geiger Berger Associates and Horst Berger Partners who pioneered the evolution of tensioned fabric structures in the US and elsewhere.

ARCH 543 - LIGHTING. 3 credits, 3 contact hours. (3;0;0).

Instructor: Manny Feris
Prerequisites: ARCH 314 or INT 222. Explores, through modeling and calculation, the means by which
architectural form and detail influence the luminous environment. Perceptual responses such as visual comfort and delight are examined. Topics include daylighting footprints, model design and testing, and computer-assisted light level analysis. Areas of investigation include the relationship between daylight and electric light in architecture; the variations of light with time; analysis of seasonal and weather differences; role of task in lighting strategies; and means of control for light quantity and quality.

**HISTORY/THEORY ELECTIVES**

**ARCH 535 - HISTORY OF ARCHITECTURAL IDEAS.** 3 credits, 3 contact hours. (3;0;0).

Instructor: TBD  
Prerequisites: ARCH 211 or (ARCH 381 and ARCH 382). Discusses seminal architectural ideas in the western world from Vitruvius to the present day. Read books written by leading architectural theorists and analyze them in detail.

**ARCH 557 - PROBLEMS IN MODERN HOUSING.** 3 credits, 3 contact hours. (3;0;0).

Instructor: TBD  
Prerequisite: ARCH 211. Attempts to provide decent, affordable and well-designed housing for broad segments of society are examined. Dwelling is examined through analysis of proto-typical design solutions in urban environments.

**ARCH 559 - SOCIAL ISSUES IN HOUSING.** 3 credits, 3 contact hours. (3;0;0).

Instructor: TBD  
Prerequisites: ARCH 211 or (ARCH 381 and ARCH 382). Lecture/seminar explores the historical, economic, social, technological, and political basis for current American housing policy and practice. Examines government, community-based and private sector attempts, both failed and successful, at providing decent, affordable, and well-designed housing for broad segments of society. Student teams analyze and discuss, in a series of classroom debates, the housing and planning implications of controversial social problems from homelessness and racial segregation to caring for the elderly and people with HIV/AIDS with an emphasis on the role of the architect.

**ARCH 576 - ARCHITECTURE OF UTOPIA.** 3 credits, 3 contact hours. (3;0;0).

Instructor: TBD  
Prerequisites: ARCH 211. Seminar for the review of utopian projects that have attempted to embody and strengthen social ideas through transformations in the structuring of space. Architectural implications of different literary and philosophical utopias analyzed with an emphasis on those experimental proposals which were realized, in whole or in part, in built form.
ARCH 583 - ST: EARTHWORK: GEOAESTHETICS AND ECOLOGY. 3 credits, 3 contact hours. (3;0;0).

Instructor: James Coleman
This course examines the phenomena of ‘land art’ that arose in New Jersey in the late 1960’s, its disruptive tendencies within the art world, its adoption of environmentalism, and its evolution into contemporary geoaesthetics. Through lectures and discussions students will analyze key texts by artists and theorists to contextualize specific art practices within the changing dimensions of today's climate crisis. Students will replicate artistic methodologies including data analysis, photography, surveying, writing, and mapping, culminating in a work of their own.

ARCH 583 - ST: COMPLEXITY & COMPOSITION. 3 credits, 3 contact hours. (3;0;0).

Instructor: Joseph Berlinghieri
The increasing complexity of 21st century façade systems and the enduring 20th century rejection of Beaux-Arts methodologies have increased the difficulty of and fostered apathy toward the art of elevation. This class will explore precedents and techniques from antiquity to the present alongside advanced façade systems to develop new methodologies that utilize contemporary technologies to compose compelling architectural exteriors.

ARCH 583 - ST: ARCHITECTURE OF HOME. 3 credits, 3 contact hours. (3;0;0).

Instructor: Carrie Gibbe
Architecture of Home

Applying vernacular knowledge to shape innovative climate responsive housing. Set against the backdrop of a general crisis of affordability, climate change, and social unrest, how and where do we look for solutions that allow us to create affordable, well-designed housing for broad segments of society? Vernacular housing models are examined to determine climate responsive contemporary design solutions. The course will emphasize creative, visual modes of representing original research.

ARCH 583 - ST: POST-PANDEMIC ARCHITECTURE. 3 credits, 3 contact hours. (3;0;0).

Instructor: Nidhip Mehta
This course focuses on changes to architectural typologies arising from post-pandemic cultural and spatial disruptions in the built environment. Students will analyze the impacts of the pandemic on current day-to-day interactions and then explore how work-from-home, remote learning, social distancing, hygiene, etc. may create new paradigms for living and interacting, invent new typologies, and impact architecture in both short-term and long-term scenarios. Students will investigate both local and global scenarios.
ARCH 583 - ST: BIOPHILIA: LANDSCAPING NARRATIVE. 3 credits, 3 contact hours. (3;0;0).

Instructor: Mariami Maghlakelidze
In this course, students will explore biophilic attributes such as natural daylight, air, gardens, and natural materials as key architectural elements that promote human health and well-being. They will research and analyze the case studies with a biophilic quality, and finally, propose a schematic diagram/design of biophilic architecture that can be plugged into studio projects.

ARCH 583 - ST: ZONING FOR OPPORTUNITY. 3 credits, 3 contact hours. (3;0;0).

Instructor: Christopher Watson
Please contact the instructor for a full course description.

ARCH 583/630 - ST: CRITICAL THEORIES IN ARCHITECTURE. 3 credits, 3 contact hours. (3;0;0).

Instructor: Nidhip Mehta
Prerequisites: ARCH 528G, ARCH 529G. This seminar is structured around notable readings on architectural history, theory and criticism to provide students with a sound basis for critical analysis and assessment. It is recommended for students who select history and theory as their area of concentration.

ARCH 583/650 - ST: ECONOMY OF BUILDING - CIRCULARITY. 3 credits, 3 contact hours. (3;0;0).

Instructor: John Cays
Restriction: completion of core sequence or equivalent. Economic consequences of design decisions. Topics include: relationship among economy, efficiency and quality; life-cycle cost of design; improving the economy of building processes and products through innovation; and environmental concerns. This course is required for the dual degree M.Arch./Master of Science in Management program. It can also be used as an elective in the M.Arch program. This course iteration will focus on the recently established but still evolving concepts and framework of the Circular Industrial Economy (CIE).

ARCH 583/655 - ST: LAND USE PLANNING. 3 credits, 3 contact hours. (3;0;0).

Instructor: Robert Hutchinson
Spatial relations of human behavior patterns to land use: methods of employment and population studies are evaluated; location and spatial requirements are related to land use plans; and concepts of urban renewal and recreational planning are investigated by case studies. Same as TRAN 655 and CE 655.
ARCH 583/679 - ST: ENVISIONING NEWARK. 3 credits, 3 contact hours. (3;0;0).

Instructor: Angela Garretson
This seminar combines classroom discussion based on historical, analytical and literary texts; field visits to Newark's districts and neighborhoods; and meetings with leaders in government, business, art, education, and community-based organizations. The objective is to introduce students to the redevelopment process underway in Newark, and to use the city as a springboard for a broader investigation of the theory and practice of urban development.

ARCH 651 - PUBLIC AND PRIVATE DEVELOPMENT. 3 credits, 3 contact hours. (3;0;0).

Instructor: Joseph Cosenza
Restriction: completion of core sequence. Introduction to the economic, financial and political aspects of real estate and their effect on architectural decision-making. Topics include: needs assessment, real estate appraisal, financial instruments, regulations and real estate, design as value-adding, and the effect of tax policies on real estate development. This course is required for the dual degree M.Arch./Master of Science in Management program. It can also be used as an elective in the M.Arch. program.

ARCH 684 - TOPICS OF SUSTAINABLE URBANISM. 3 credits, 3 contact hours. (3;0;0).

Instructor: TBD
Cities are growing at an unprecedented speed. Cities currently account for about 70 percent of global carbon emissions and over 60 percent of resource use. We have to develop a vision for more sustainable cities and new protocols and processes to implement more sustainable visions for urban areas. This course will provide an insight into the challenges we face (growing number of slum dwellers, inadequate infrastructure and services); it will provide an overview of goals and existing frameworks and speculate on solutions to address sustainability urban issues.

HCAD GENERAL ELECTIVES

AD 490 - ST: DESIGN THINKING. 3 credits, 3 contact hours (3;0;0).

Instructor: TBD
This course will introduce students to the design thinking methodology. Design thinking is a human-centered problem-solving approach and design process that guides the designer/creator through various steps that include: empathize, define, ideate, prototype and test. Students will learn through the analysis of case studies and project-based exercises how this workflow can lead to innovative solutions from product design to environments and user experiences.
AD 490 - ST: DESIGN OF SURVEILLANCE. 3 credits, 3 contact hours (3;0;0).

Instructor: Gretchen Von Koenig
This course will look at the way that surveillance practices materialize in the built environment. Enacted by designers and non-designers alike, this discussion-based course interrogates the many formats that surveillance takes and questions how surveillance design interacts with systems of power, culture and society. The course will have weekly readings (and other multimedia formats such as documentaries, podcasts, or websites) that will look at designs of all scales: the architecture of prisons, schools and corporate offices; the interior designs of banks, classrooms and situation rooms; product design of mirrors, burglar alarms and smart watches; and digitally-based designs of cookies and facial recognition. The course primarily focuses on surveillance in the United States from the industrial revolution to now, including speculative visions of the future. Topics include: state-sanctioned surveillance and cultural concepts of privacy, disability and safety surveillance, the age of surveillance capitalism, biometric monitoring and health cultures, sound-based surveillance of Alexa and Siri, and citizen-enacted “sousveillance” to monitor activities of the state–like how cell phones become a way to “watch” the police. We will look at the ways that surveillance has been used to inform design, such as theories of scientific management, time-motion studies, and ethnographic techniques. This class will have weekly readings, short writings and discussions as well as two critical design research projects (or research papers) to be developed and presented over the course of the semester.

AD 490 - ST: CINEMATIC DESIGN. 3 credits, 3 contact hours (3;0;0).

Instructor: Miguel Rodrigues
This 3D Cinematography course will focus on learning and utilizing Hollywood-inspired camera work, visual story-telling techniques, high end blocking and staging shots with a virtual production set up in Unreal Engine 5. Students will learn different production techniques and approaches, such as the use of phones, iPads and/or tablets as virtual cameras. This will allow for the discovery of new types of video production that can for example enable natural camera movements or enhance the discovery and/or creation of design elements through this novel interface with the digital environment. Students will learn about cinematography, layout, composition, lighting, and set design for the purpose of creating 3D cinematics for movies, animations, video games, or the representation of designed environments and products. Students should have prior experience in 3d software programs such as Autodesk Maya and/or Unreal Engine.

AD 490 - ST: BUILDING A BRAND: FROM FASHION TO ENVIRONMENTS. 3 credits, 3 contact hours (3;0;0).

Instructor: Barbara Weinreich
What is the power of a brand? It can motivate you, inspire you and reassure you. It can also dissuade you and repel you. As a designer, you hold the key to turning that power into something physically and viscerally experienced. From logo to store, from object to experience, from fashion to fixtures, the manifestation of the brand into design is an essential part of the designer’s mission. In this course, we will cover the history of branding and how it has influenced not just our actions but how we define ourselves. Then we will look at branding across design disciplines, including fashion, industrial design, experience
design and interior project types (retail, hospitality, healthcare, commercial and institutional). And what about the extension of a brand design into virtual spaces? Class sessions will use case studies and precedents to analyze different branding typologies. Assignments will also include exercises where students analyze a brand development over time, refresh a tired legacy brand, and propose a physical/experiential brand environment for an online brand. Guest lecturers in a variety of areas such as exhibition and experience design, retail design and fashion design will share their insights on the power of the brand.

**AD 490 - ST: MAPPING EQUITY: The Design of Visual Statements to discuss Social Justice. 3 credits, 3 contact hours (3;0;0).**

Instructor: Ana Penalba
Design is a practice that we can use not only to solve problems but to ask questions. Now more than ever we need creative thinkers who use their skills to question, intervene and discuss the issues that are challenging the course of our times. This class is designed to give students the intellectual tools to think critically and innovatively at the same time that training their creativity to communicate their beliefs and thoughts through the production of visual statements; we will work simultaneously in both, the thinking and the making. First, students will be invited to explore different topics that examine the relationship between Design and Equity -such as gender equity, environmental equity, social equity...- and explore different representational formats -such as performance, installations, sculpture, video or drawings- to visually discuss, communicate and materialize their conclusions and concerns. The aim of this course is to use Design as a tool to defend and fight for what we care; we need to foreground the now to design the future that we want!