Electives List
Spring 2022
Hillier College of Architecture & Design
11/23/2021

UNDERGRADUATE ELECTIVES
Spring 2022 elective offerings are listed below. For A+D and B.S.Arch students all of these courses count as electives. For B.Arch students, electives are listed in three categories: 1) Technology Electives, 2) History Theory Electives; and 3) Architecture (College) Electives. The Spring 2022 NJIT Course Schedule indicates all scheduling information. Search by clicking on the appropriate prefix for each course, listed in the left-hand column (eg. ARCH, ID, AD, etc.). In addition to the electives listed below, eligible students* may also take advantage of the graduate electives.

Course #	Section #	Title	Instructor
Technology Electives			
ARCH 301	002	Digital Modeling and Fabrication	TBD
ARCH 316	002	Computer Applications to Architecture	R. Taher
ARCH 337	002	Building Information Modeling	TBD
ARCH 537	002	Advanced Structures: Cable & Tensioned Fabric Structures	R. Taher
History Theory Electives			
ARCH 408	002	Investigations in the Contemporary Landscape	TBD
ARCH 583	002	Contemporary Methods of Historic Preservation	K. Hofmann
Architecture (College) Electives			
ID 341	002	Sustainable Materials and Processes	J. Alcala
AD 490	002	ECO-TECTURES: The invention of new Design Forms and Techniques to connect with our natural resources	A. Estebanez
AD 490	002	The Edge Effect: Design at the Intersection of Habits	M. Decker

*Undergraduate students with a cumulative GPA of 3.0 or higher are encouraged to take 600-level graduate electives. Undergraduate students pay the undergraduate tuition rate for graduate courses and can apply up to 12 credits toward both their undergraduate and graduate Hillier College degree. Prior to enrolling in a graduate elective, you must apply for a Dual Degree Program, by completing the approval form and submitting it to the Registrar for approval.

GRADUATE ELECTIVES

Course #	Section #	Title	Instructor
ARCH 651	852	Public and Private Development	J. Cosenza
ARCH 662	102	Urban Theory and the Contemporary City	G. Esperdy
ARCH 684	002	Topics of Sustainable Urbanism	TBD
ARCH 689	102	AI / VR in Architecture	T. Narahara
MGMT 699	102	Innovation, Social Practice and Place-based Solutions	S. Ishee

UNDERGRADUATE ELECTIVES
Technology Electives

ARCH 301: Digital Modeling and Fabrication
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. 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. Students model and fabricate full scale assemblies individually and in teams and contribute to a final collectively designed project. Familiarity with various software is encouraged but not required.

ARCH 316 Computer Applications to Architecture
The course explores the rising BIM technology with an emphasis on its structural applications as they relate to architectural design. The course also covers some structural computer applications using different types of computer programs. It is designed to help architecture students acquire and develop a more integrated approach to architecture. The course content consists mainly of some hands-on training projects in addition to some BIM related lectures. The lectures include some case studies such as the $611-million Nationals Park, in Washington, DC, illustrating how BIM can be successfully implemented. Various projects with different types of buildings will be used in the computerized applications.

ARCH 337: Building Information Modeling
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 537: Advanced Structures: Cable & Tensioned Fabric Structures
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.

UNDERGRADUATE ELECTIVES (continued)
History Theory Electives

ARCH 408: Investigations in the Contemporary Landscape
Introduces the design, construction, and management of contemporary landscape projects through case studies, field trips, and personal contact with prominent practicing landscape architects. A historical perspective of landscape architecture is used as a context for discussion.

Arch 583: Contemporary Methods of Historic Preservation
This seminar proposes to extrapolate preservation into the future by imagining its usefulness as a viable form of creative practice that, not unlike architecture, begins with careful analysis of what already exists. The design, construction, and maintenance of buildings account for more than 40% of all global greenhouse gas emissions. Beyond helping architecture curb its dependence on the extraction of finite resources, preservation requires professionals to consider how our decisions register on social, historical, and environmental scales. In this course, students will use **both** digital (Rhino, CAD, GIS, Meshroom, Agisoft, Adobe Suite, etc.) **and** analog means of thinking to identify, assess, and interpret how the new interfaces with the old. Field studies in urban, suburban, and rural contexts will create opportunities to engage with architecture as both a material entity and repository of collective memory. Preservation experts will deliver guest lectures on various topics ranging from professional practice, exhibition/installation, landscape rehabilitation, and climate change. Course content will take three forms: engaging (reading, visiting), processing (writing, speaking, critiquing), and making. The course will culminate in individual preservation case studies that have written, graphic, and verbal components.

Architecture (College) Electives

ID 341: Sustainable Materials and Processes
This course will comprise of lectures and field trips that take a critical look at the traditional materials and processes used in manufacturing and evaluate alternatives based on research and experimentation. Each student will perform a Life Cycle Analysis (LCA) on an existing product by following the products life from the mining of raw materials to disposal taking particular attention to energy usage, use of natural resources, toxicity and decomposition. Prerequisites: ARCH 363

AD 490: ECO-TECTURES
In this class we will research how the physical elements that compose our cities, buildings and interior-scapes have a critical role in the way we feel and mediate with our environment. Students will design new interior spaces, material architectures, and artifacts that respond not only to human needs but also to environmental urgencies. The challenge will be not necessarily to represent what you see, but to unveil the design structures that configure our relationship with the environment and that create innovative forms of experiencing and inhabiting our built settings. Prerequisites: ARCH 363

UNDERGRADUATE ELECTIVES (continued)

AD 490. The Edge Effect: Design at the Intersection of Habits. 3 credits, 3 contact hours
The terrestrial wilderness on our planet has been shrunken down to only 23% of our landmass and through the ever-increasing world population our cities are becoming larger and larger. The megalopolis is not an exception anymore but is becoming the norm. At the same time our urban environments are mostly designed to control and often to keep flora and fauna in check in favor of a habitat perfectly geared towards humans only.

In this class we will look at the intersection of the human habitat and the surrounding ecosystems and investigate the potential to soften the often-stark boundaries that we have erected. We will pursue the question if we can contribute to the conservation of biodiversity as designers through interventions at various scales: from the product design to the regional scale. We will look at various ecosystems and probe the potential to design with for a wide variety of life forms. Prerequisites: ARCH 363

GRADUATE ELECTIVES

ARCH 651: Public and Private Development
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 MUD program.

ARCH 662: Urban Theory and the Contemporary City
This course surveys the work of major thinkers who have shaped modern and contemporary urbanism, including critics, planners, architects, sociologists, and geographers. Emphasis is on theoretical texts from the late 19th century to the early 21st century that have had a significant influence on urban evolution in both social and spatial dimensions, in the central city and in/beyond the periphery, wherever urban people dwell.

ARCH 684: Topics of Sustainable Urbanism
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. This course will investigate the challenges we collectively face (transportation, coastal resilience, suburban sprawl, etc.), analyze global case studies, and speculate on solutions which address sustainable urbanism. This course is required for the MUD program.

GRADUATE ELECTIVES (continued)

ARCH 689: AI / VR in Architecture

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).

MGMT 699: Innovation, Social Practice and Place-based Solutions

During this course, students will explore the use of the arts, culture and design, economic and social policy development, urban and rural planning, innovative branding, and community engagement toward management of equitable and sustainable community transformation. Students will examine existing creative practices, technologies and tools and conduct analyses of their effectiveness for inclusive community-engaged development and smart growth.