Electives List - Spring 2021
Hillier College of Architecture & Design
Nov 20, 2020

Undergraduate Electives

**In addition to the electives below, there are courses that are regularly offered under *AD, ARCH, DD, ID, and INT* course numbers which students may opt to take to fulfill design and/or arch elective requirements with the approval of their advisor. The schedules for those courses can be found on the Registrar's Course Schedule website under the course prefixes noted above.

Course #	Section #	Title	Instructor
AD 490	006	Life Drawing for Animation Tues 12:30 – 3:30 **Sync Online**	Ross
AD 490	008	Introduction to Parametric and Generative Design Tues 9:00 – 12:00 **Sync Online**	Schwartz
AD 490	450	Drawing for Equity Tues 2:30- 5:30 **Sync Online**	Penalba
AD 490	452	The Digital Asset: Modeling, Texturing and Managing Mon 7:30 – 10:30 **Sync Online**	Wendell
DD 415	452	Web / Exhibit Development Fri 7:30 -10:30 **Sync Online**	Wendell
Arch 331	450	Landscape Architecture Wed 11:30 – 2:30 **Sync Online**	Navin
Arch 337	002	Building Information Modeling Tues 7:30 – 10:20 **Sync Online**	Benanti
Arch 583	002	Informed Form: "Agency" in Design Thurs 7:30 – 10:30 **Sync Online**	Ogorzalek
Arch 583	004	Dynamic Construction in Arch Thurs 7:30 – 10:30 **Sync Online** ******This course has been approved for the Sustainability minor.***	Parlac
Arch 583	006	Resilient Structural Design Tues 2:30 -5:30 **Sync Online**	Taher
Arch 583	450	Structural Computer Applications and BIM Wed 11:30 – 2:30 **SYNC Online**	Taher
Arch 583	452	Building Energy Modeling ONLINE Course - ******This course has been approved for the Sustainability minor.***	Kim

Graduate Electives

As of the Spring 2020 semester, the university has updated its policy on undergraduate enrollment in graduate courses. Undergraduate students who wish to enroll in graduate courses for credit toward undergraduate requirements must FIRST apply *and* be accepted into a BS/MS program. Qualified undergraduate students not pursuing a BS/MS may still enroll in graduate courses; however, 1) graduate courses cannot be applied toward any undergraduate course credit, 2) graduate course costs must be paid at the graduate tuition rate, and 3) undergraduate financial aid cannot be applied toward graduate course costs.

Course #	Section	Title	Instructor
Arch 645	002	AI, VR, and Architecture Thurs 7:30 – 10:30 **Sync Online**	Narahara
Arch 662	102	Urban Theory and Contemporary City Tues 6:00 -9:00 **Sync Online**	Esperdy
DD 621	450	Character and Facial Modeling for Animators **Online**	Rodrigues
DD 622	450	Visual Storytelling and Storyboarding **Online**	Ross
DD 624	450	Digital Audio **Online**	Miller
DD 625	450	Environmental Design **Online**	Wendell
DD 634	450	Physical Computing for Designers **Online**	Wendell
DD 640	450	UI-UX Design **Online**	Kum-Biocca
MIP	655	Land Use Planning Tues 2:30 -5:30 **Sync Online**	Navin
MIP 673	450	Infrastructure Planning in Practice Wed 11:30 – 2:30 **Sync Online**	Theodore

Course Descriptions:

AD 490-006: Life Drawing for Animation (Ross) This course will offer students the opportunity to draw from live models which is an invaluable training experience for understanding basic anatomy, gesture, form, and expression. We will learn how to exhibit emotion through poses, facial expression, and lighting. We will also be covering other topics within life drawing such as costumes, drapery, how to render various materials, and how we can use costumes and props to develop various character archetypes. We will explore how to capture the look and personality of people of different ethnicities, cultures, and backgrounds, so that students can learn to appreciate and replicate the diversity of the world we live in. This course is helpful for all design majors and is especially valuable for those interested in pursuing a career in character design for video games, film, and print. Students interested in 3D character modeling will significantly benefit from content covered in this course, as crucial knowledge of musculature, anatomy, and posing are required knowledge bases for this skill set

AD 490-008: Introduction to Parametric and Generative Design (Scwartz) This course is an introduction to parametric and generative design for applications in interior space, products, and games. Parametric design is a process of creating forms through parameters and relationships rather than specific numbers. Generative design has been rapidly growing in popularity as it enables designers to begin with a design or design constraints, and have the computer do the heavy lifting of finding variations that optimize the metrics that the creator is interested in. This course will cover various software tools that range from product scale (making tables in Fusion360) to building (laying out furniture and lighting for the best views in an office in Revit) to creating entire cities (CityEngine), all with a click of a button. The course will be composed of several assignments, with a half-semester final project in the software/method of the students choosing. The course is intended for all design-related majors, including game design and informatics students looking to learn how to create digital assets for complex scenes.

AD 490-450: Drawing for Equity (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!

AD 490-452: The Digital Asset: Modeling, Tecturing and Managing (Wendell) Visual effects, 3D Animation, Game design/development and VR/AR all make use of digital assets. These assets often revolve around 3D models that are UVW unwrapped and textured. In the past the level of detail for these assets varied depending on the final media. The current and near future pipelines creates a single level of detail for all digital assets. This course teaches a modern pipeline for high detail modeling, unwrapping and texturing (digital painted textures) for DD, IT, and COM students. As an online course we can provide the offering across the university and bring our expertise into a number of departments. As a single 3 credit course our students interested in learning more specific techniques in these areas (often asked for by our students) can spend a semester developing a reliable and robust pipeline for sophisticated asset development. The specific tools for this class will be industry standard - Maya, 3DS Max, Photoshop, MARI and Substance Painter.

DD 415: Web / Exhibit Development (Wendell) Prerequisites: AD 150, DD 284, IT 201. Instructor may waive or accept alternate prerequisite(s) based on individual student preparation. Overview of multimedia exhibit design dealing with issues of graphic identity human-computer interactions, and information visualization as tools for comprehension, enhanced communication, and effective decision-making. Exhibit types include educational symposia, museum/gallery shows, and online environments. Analyses and creative project(s) are required.

Arch 331: Landscape Architecture (Navin) An overview of the opportunities and constraints of landscape designs. Emphasis on developing a practical understanding of the potentials of earth, water and plants in architecture. Students given an overview of social and ecological determinants of relations between land and buildings.

Arch 337: Building Information Modeling: (Benanti) 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. Projects 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 583-002: Informed Form: "Agency" in Design (Ogorzalek) In what many consider the Anthropecene Epoch we must come to terms with a period in history when human activity has started to have a significant impact on the planet's climate and ecosystems. Times have changed and Architecture must recognize that it exists in a very different world today than it did in the past. A world full of challenges – from new global economic structures to an emerging information culture based upon networks, systems and access to instantaneous data. In this new world what is the role of the Architect, of Architecture, and its relevance to society? Architecture finds itself at a crossroad where traditional consideration of what Architecture "means" has been replaced by what it "does". If we think differently about how Architecture exists in the world today, then perhaps we can create opportunities to make explicit the contributions it can have for future generations. This course examines how "Agency" in design allows a reconsideration of the role Architecture plays in culture and society. In doing so, it seeks to reclaim identity and relevance for the act of design in Architecture as a critical endeavor for shaping the built environment. Students will have an opportunity to understand a body of critical thought within architectural discourse. As a result, it will provide students the intellectual underpinnings to inform their design thinking and actions for future projects – how their Architecture can become a catalyst of change in response to the challenges facing our world today.

Arch 583-004: Dynamic Construction in Architecture (Parlac) The seminar will focus on theories behind kinetic, responsive and adaptive architectural research. 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 586-006: Resilient Structural Design (Taher)** This course discusses the topic of structural building design for various hazards which are mainly earthquakes, high winds/hurricanes and floods. Each type of hazard is discussed separately. First, the nature of the hazard, expected damages and the corresponding response of a structure are outlined. Then the structural design process is developed based on the requirements of the latest codes and standards. The course also includes a discussion of some of the most recent research findings regarding wind and seismic design. Design examples are used to illustrate the various design methods, and students apply the knowledge acquired in this course to a practical building design project. Students are also introduced to some of the standard procedures used in safety assessment and evaluation of damaged buildings in the aftermath of hurricanes and earthquakes.

Arch 583-450: Structural Computer Applications and BIM (Taher) The course will explore the rising BIM technology with an emphasis on its structural applications as they relate to architectural design. It is designed to help architecture students acquire and develop a more integrated approach to architecture. The course consists mainly of some hands-on training in the use of structural BIM tools and other structural analysis software. Various projects with different types of buildings will be used in the computerized applications. Students will receive some extended training on the use of REVIT in structural applications. Some structural analysis and design programs, such as RISA and ROBOT, are designed to communicate and work with REVIT. Students will be introduced to these programs as well. The course will also include some case studies such as the $611-million Nationals Park, in Washington, DC, illustrating how BIM could be successfully implemented.

Arch 583-452: Building Energy Modeling (Kim) This course introduces the students to building energy modeling and energy optimization techniques using the EnergyPlus whole-building energy simulation program. Students will practice whole-building energy simulation, including the hourly modeling of dynamic thermal envelope loads and system simulations; and explore various energy efficiency measures to optimize the envelope and system performance of their projects. ******This course has been approved for the Sustainability minor.***

Arch 645-002: AI, VR and Architecture (Narahara) This course will focus on Artificial Intelligence (AI) and Virtual Reality (VR) in the context of Architecture and Urban Design. The recent progress in data science technologies allows us to understand the correlations between artistic designs and their implicit qualities in a quantitative data format, and such data can be further used to extract features related to the attractiveness of artistic expressions using methods such as deep neural networks. Furthermore, use of the immersive VR technologies could help the extraction of such dataset beyond the representations of architectural spaces.

Arch 662-450: Urban Theory and Contemporary City (Esperdy) 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. These texts are also examined within the context of key socio-economic and cultural developments, including industrialization, post-industrialization, capitalism, marxism, post-colonialism, segregation, im/migration, neoliberalism, gentrification, globalization and information technologies. Throughout the course, theory is understood as something that can shape urban form, urban policies, and urban attitudes, and as something that can guide urban analysis. To this end, theoretical texts and other readings and will be paired with case studies that offer students the opportunity to explore the relationship between urban thought and urban action, using diverse and global examples from the mid-20th century to the present.

DD 621-450: Character and facial Modeling for Animators (Rodrigues) Prerequisites: Basic background in in the use and application of digital media in design. The course will introduce students to the language and conventions of manipulating tools and techniques to develop and create 3 dimensional character design.

DD 622-450: Visual Storytelling and Storyboarding (Ross) Prerequisites: DD 601, DD 602. Storyboarding is the preparation of a conceptual and thematic graphic plan to tell a story using animations, video games, interactive media and experiences, advertisements, music videos, or graphic novels. This course will cover the fundamentals of visual storytelling and the various applications possible in a visual narrative. Techniques for art direction are covered including the use of storyboards, concept art, and animatics to communicate. Students will translate a written narrative into a visual experience in this project-based class with the use of camera framing, camera angles, gesture, and expression. Issues of lighting, color, and mood will be included resulting in a student developed full-story pitch.

DD 624-450: Digital Audio (Miller) Prerequisites: . Corequisites: . A studio class that provides a baseline understanding of sound design within an animated video and video game environment. Course includes an introduction to sampling, field recording, sound effects, production techniques, mixing, and general sound design for the purpose of integrating and managing the integration of audio in motion pictures, television, video games, and any other sound-supported media. Analytical and creative projects are required.

DD 625-450: Environmental Design (Wendell) Prerequisites: Basic background in in the use and application of digital media in design. Corequisites: . The course will introduce students to the language and conventions of manipulating tools and techniques to develop and create simulated environments.

DD 634-450: Physical Computing for Designers (Wendell) Prerequisites: Basic background in in the use and application of digital media in design. Corequisites: . Design course focusing on two-and three-dimensional visual communication of data, including interactive and scripted/animated communication as well as still-image utilization. Applications may include website creation, information kiosks, exhibit design, educational videos, scientific visualization, and other graphics-intensive projects.

DD 640-450: UI-UX Design (Kum-Biocca) Prerequisites: . Corequisites: . Application of theories, research methods, ethics, and design processes of UI/UX (user interface/user experience) design. Students will research, develop, and test basic UI/UX designs. Design strategies will be discussed as they apply to physical, virtual, and hybrid prototype solutions.

MIP 655- 450: Land Use Planning 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.

MIP 673 – 450: Infrastructure Planning and Practice Infrastructure planning principles, methods and tools. Through selected examples, acquaintance with infrastructure planning theories and models, quantitative methods of research and analysis, information management, decision making, and implementation techniques.