

ARCHITECTURE (FA) {ARCH}

Undergraduate Studios

L/R 201. Visualization I: Representation. (A) Phillips. Prerequisite(s): This course is not open to students in their first or second freshman terms at Penn. Students must be rising sophomores to advance register for this course.

Introduces technical drawing and explores its thematic possibilities, through both an analysis of antecedents and the production of new works. These complimentary studies serve both to establish an understanding of representation as the foundation to visual communications and to develop the ability for seeing through drawing.

202. Visualization II: Fabrication. (B) Phillips. Prerequisite(s): ARCH 201.

Continues research into visualization with a special emphasis introducing the fabrication shop, tools and techniques. The capacity of materials, their manipulation and the consequences of their inter-relationships are explored as a fundamental issue in making. Through the analysis of precedents and the production of new works, visualizing these relationships compliments drawing with a material imagination and vocabulary.

301. Design Fundamentals I: Perception. (A) Mitnick/Schmidt-Ulrich. Prerequisite(s): ARCH 202.

An introduction to principles of visual perception and the language of visual form. Students explore the relationship between the two-dimensional images and their corresponding three-dimensional interpretation in plan, section, elevation, axonometric, one-point perspective, and two-point perspective. Moving back and forth between these dimensions leads to the development of a working design method.

302. Design Fundamentals II: Structure and Metaphor. (B) Mitnick/Schmidt-Ulrich. Prerequisite(s): ARCH 301.

An introduction to two and three-dimensional design. Students explore the relationship between form and meaning, investigating the relationship between visual structure and metaphor, acquiring creative problem-solving skills in abstract and concrete processes, developing a sense of material and craft, and learning to communicate verbally and graphically.

401. Architecture and Landscape Design I. (A) Leatherbarrow/Berrizbeitia. Prerequisite(s): ARCH 302.

An introduction to fundamental topics in architecture and landscape architecture. Issues of mapping, placement, scale, and construction are explored through studio design exercises, site visits, and discussions. Course work focuses on the preparation and presentation of discrete design projects that emphasize the acquisition of representational and analytical skills, and the development of imaginative invention and judgment.

402. Architecture and Landscape Design II. (L) Wesley. Prerequisite(s): ARCH 401.

An introduction to the fundamentals of design three-dimensional objects of use. Concepts and techniques of description, projection, and fabrication will be explored through a series of workshop exercises using parametric solid modeling computer-aided design software, rapid prototyping (3D printing), and laser cutting technology. The course is intended to provide a background in three-dimensional design fundamentals for students in engineering, business, and finearts.

Undergraduate Theory

SM 411. (ARCH711, LARP780) History and Theory I. (A) Faculty. Corequisite(s): ARCH 401.

This is a lecture course with discussion groups that meet weekly with teaching assistants.

L/R 412. Theory II. (B) Leatherbarrow. Corequisite(s): ARCH 402.

This course traces the emergence of contemporary issues in the field by exploring the architecture of the twentieth century. Buildings, projects, and texts are situated within the historical constellations of ideas, values, and technologies that inform them through a series of close readings. Rather than presenting a parade of movements or individuals, the class introduces topics as overlapping strata, with each new issue adding greater complexity even as previous layers retain their significance. Of particular interest for the course is the relationship between architecture and the organizational regimes of modernity.

Undergraduate Intensive Major in Design

431. (ARCH531) Construction I. (A) Falck.

Course explores basic principles and concepts of architectural technology and describes the interrelated nature of structure, construction and environmental systems.

432. (ARCH532) Construction II. (B) Falck.

A continuation of Construction I, focusing on light and heavy steel frame construction, concrete construction, light and heavyweight cladding systems and systems building.

433. (ARCH533) Environmental Systems I. (A) Malkawi.

An introduction to the influence of thermal and luminous phenomenon in the history and practice of architecture. Issues of climate, health and environmental sustainability are explored as they relate to architecture in its natural context. The classes include lectures, site visits and field exploration.

434. (ARCH534) Environmental Systems II. (B) Braham.

This course examines the environmental technologies of larger buildings, including heating, ventilating, and air conditioning, lighting, and acoustics. Class meetings are divided between slide lectures, work sessions, and site visits.

L/L 435. (ARCH535) Structures I. (A) Farley.

Theory applied toward structural form. A review of one-dimensional structural elements; a study of arches, slabs and plates, curved surface structures, lateral and dynamic loads; survey of current and future structural technology. The course comprises both lectures and a weekly laboratory in which various structural elements, systems, materials and technical principles are explored.

L/L 436. (ARCH536) Structures II. (B) Farley.

A continuation of the equilibrium analysis of structures covered in Structures I. The study of static and hyperstatic systems and design of their elements. Flexural theory, elastic and plastic. Design for combined stresses; prestressing. The study of graphic statics and the design of trusses. The course comprises both lectures and a weekly laboratory in which various structural elements, systems, materials and technical principles are explored.

Undergraduate Electives

SM 102. Architecture Today. (A) Rybczynski.

Why do buildings by different Architects look so different? The Getty Museum in Los Angeles, for example, is quite different from the Bilbao Guggenheim; Rem Koolhaas' proposed library in Seattle seems world's apart from Tom Beeby's Harold T. Washington Library in Chicago. In addition to site function, and construction, architecture is affected by style, and today there are many different stylistic approaches. Style is neglected in most discussions of architecture yet it is central to the design and appreciation of buildings. The seminar will examine the role that style plays in the work of prominent contemporary architects both in the United States and abroad. Field trips, seminars and selected readings will form the basis for four graphic and written assignments

440. Introduction to Computers in Architecture. (B) Kearney.

This course provides an introduction to computer graphic technology in the context of current architectural practice. We use AutoCAD's latest release (now 2007) as the basic software for the course. AutoCAD is the most widely-used architectural software and provides a good grounding for exploration of other programs. Topics include basic vector graphics, two-dimensional drawing and drafting and basic three-dimensional modeling. The course is organized around a series of structured exercises that illustrate basic principles and enable students to develop greater facility with the software. The modeling emphasis is placed on quick study models as part of the design process. There is also a field trip to the offices of Venturi, Scott Brand and Associates to see the use of computers in their practice. No experience with Auto CAD software is required.

462. (ARCH762) Design and Development. (B) Rybczynski.

The purpose of this course is to introduce non-architects to architecture, and to describe the important contribution that physical design can make to successful real estate development. Issues in contemporary architecture are discussed. The examples and reading illustrate the important role of architectural design in development. Topics include space planning, commercial buildings, retail environments, adaptive reuse, downtown development, mixed-use projects, housing (both single- and multi-family), and planned communities. Invited lecturers include architects, real estate developers, and homebuilders.

490. Independent Study. (C) Faculty. Prerequisite(s): Permission of the Director of the Undergraduate Program.

491. Senior Thesis. (C) Faculty. Prerequisite(s): Permission of the Director of the Undergraduate Program.

499. Senior Honors Thesis. (C) Prerequisite(s): Permission of the Director of the Undergraduate Program.

727. (IPD 527) Architectural Renderings in Wash. (C) Blatteau.

Industrial design (ID) is the professional service of creating and developing concepts and specifications that optimize the function, value and appearance of products and systems for the mutual benefit of both user and manufacturer. Industrial designers develop these concepts and specifications through collection, analysis and synthesis of user needs data guided by the special requirements of the client or manufacturer. They are trained to prepare clear and concise recommendations through drawings, models and verbal descriptions. The profession has evolved to take its appropriate place along side Engineering and Marketing as one of the cornerstones of Integrated Product Design teams. The core of Industrial Design's knowledge base is a mixture of fine arts, commercial arts and applied sciences utilized with a set of priorities that are firstly on the needs of the end user and functionality, then the market and manufacturing criteria.

This course will provide an overview and understanding of the theories, thought processes and methodologies employed in the daily practice of Industrial Design. This includes understanding of ethnographic research and methodologies, product problem solving, creative visual communication, human factors / ergonomics application and formal and surface development in product scale. This course will not enable one to become an industrial designer but will enable one to understand and appreciate what industrial design does, what it can contribute to society and why it is so much fun.

Graduate Studios

501. Design Studio I. (A) Russo and Faculty. Corequisite(s): ARCH 521.

An introductory architectural design studio through which students develop critical, analytical and speculative design abilities in architecture. Students develop representational techniques for the analysis of social and cultural constructs, and formulate propositions for situating built form in the arena of the urban and suburban environment. The studio initiates innovation through the analysis of complex systems, algorithms and the cultivation of spatial formations and behaviors that are emergent and yet defined. It introduces computation, geometric techniques, and digital fabrication. Projects explore the formation of space in relation to the body, and the development of small scale public programs.

502. Design Studio II. (B) Fierro and Faculty. Corequisite(s): ARCH 522.

This studio explores urban architecture as an embodiment of cultural values. Siting, enclosure of space and tectonic definition are stressed in order to challenge students to project relevant and inventive architectural situations.

601. Design Studio III. (A) Braham and Faculty. Corequisite(s): ARCH 621.

The first intermediate design studio consisting of six independent sections, each with its own orientation to issues of technology and ecology. Design projects involve more complex public or institutional buildings, and require the detailed resolution of one ecological and technological dimension. Ecologies are considered in their natural, social, and technological dimensions, and in various degrees of abstraction and realization. This includes affinities between modes of analyzing and operating within natural ecosystems and systemic models of analysis of organizations, economies, urbanisms and material cultures, alternative economies, and the cultural politics of environmentalism, as well as the study of energy and resource use, recycling, environmental quality, and biomimetics. The studio is taught in close collaboration with Visual Studies Workshop III, whose techniques and exercises are tailored to each studio section.

602. Design Studio IV. (B) Faculty.

This studio enables students to develop and resolve the design of a building in terms of program, organization, construction and the integration of structures, enclosure and environmental systems as well as life safety issues. Students select from a range of individually-directed studios within this overall framework. Each instructor develops a different approach and project for their section of this studio.

Studios incorporate the expertise of external consultants in advanced areas of technology, engineering and manufacturing.

701. Design Studio V. (C) Faculty.

A set of Advanced Architectural Design studios are offered from which students select through a lottery. Topics and sites vary by instructor.

702. Design Studio VI. (B) Faculty.

In the final semester of the program, students select from three options: ARCH 702, an advanced design studio, ARCH 704, a research studio, the exploration of a topic or theme established by an individual faculty member or group of faculty members; or ARCH 706, an independent design thesis, the exploration of a topic or theme under the supervision of a thesis advisor.

703. Post-Professional Architectural Design Studio. (A) Dubbeldam.

An Advanced Architectural Design Studio specifically tailored to post-professional students. Through this studio, students engage in the challenges and opportunities presented by changes in society, technology, and urban experience. Through design projects, they explore alternative modes and markets for practice, along with new directions and new tools for design.

704. Advanced Design: Research Studio. (B) Faculty.

In the final semester of the program, students select from three options: ARCH 702, an advanced design studio; ARCH 704, a research studio, the exploration of a topic or theme established by an individual faculty member or group of faculty members; or ARCH 706, an independent design thesis, the exploration of a topic or theme under the supervision of a thesis advisor

706. Independent Thesis. (B) Faculty.

In the final semester of the program, students select from three options: ARCH 702, an elective design studio, selected from among the design studios offered for ARCH 602; ARCH 704, a research studio, the exploration of a topic or theme established by an individual faculty member or group of faculty members; or ARCH 706, an independent design thesis, the exploration of a topic or theme under the supervision of a thesis advisor.

718. (EALC258) Japanese Architecture. (A) Steinhardt.

An introduction to the visual, aesthetic, historical, religious, philosophical, and symbolic aspects of Japanese structures from earliest times to the mid-19th century. Through a discussion of shrines, temples, palaces, tombs, cities, and gardens the student will explore what makes Japanese architecture distinctive and how the traditions of Japanese architecture evolve over time.

Graduate Visual Studies Workshops

521. Visual Studies I. (A) Veikos and Faculty. Corequisite(s): Arch 501.

The study of analysis and projection through drawing and computer visualization

522. Visual Studies II. (B) Faculty. Corequisite(s): ARCH 502.

A continuation of the study of analysis and projection through drawing and computer visualization.

621. Visual Studies III. (A) Faculty. Corequisite(s): Arch 601.

The final of the Visual Studies half-credit courses. Drawings are explored as visual repositories of data from which information can be gleaned, geometries tested, designs refined and transmitted. Salient strengths of various digital media programs are identified and developed through assignments that address the specific intentions and challenges of the design studio project.

Graduate Required and Designated Courses

L/R 511. History and Theory I. (A) Lahiji.

The first of three required courses in the history and theory of architecture, this is a lecture course with discussion groups that meet weekly with teaching assistants. The course explores fundamental ideas and models of architecture that have emerged over the past three hundred years, with specific focus on constructive and generative models.

L/R 512. (ARCH412) History and Theory II. (B) Leatherbarrow.

This course traces the emergence of contemporary issues in the field by exploring the architecture of the twentieth century. Buildings, projects, and texts are situated within the historical constellations of ideas, values, and technologies that inform them through a series of close readings. Rather than presenting a parade of movements or individuals, the class introduces topics as overlaying strata, with each new issue adding greater complexity even as previous layers retain their significance. Of particular interest for the course is the relationship between architecture and the organizational regimes of modernity.

531. (ARCH431) Construction I. (A) Falck.

Course explores basic principles and concepts of architectural technology and describes the interrelated nature of structure, construction and environmental systems.

532. (ARCH432) Construction II. (B) Falck.

A continuation of Construction I, focusing on light and heavy steel frame construction, concrete construction, light and heavyweight cladding systems and systems building.

533. (ARCH433) Environmental Systems I. (A) Malkawi.

An introduction to the influence of thermal and luminous phenomenon in the history and practice of architecture. Issues of climate, health and environmental sustainability are explored as they relate to architecture in its natural context. The classes include lectures, site visits and field exploration.

534. (ARCH434) Environmental Systems II. (B) Braham.

This course examines the environmental technologies of larger buildings, including heating, ventilating, air conditioning, lighting, and acoustics. Modern buildings are characterized by the use of such complex systems that not only have their own characteristics, but interact dynamically with one another and with the building skin and occupants. Questions about building size, shape, and construction become much more complex with the introduction of sophisticated feedback and control systems that radically alter their environmental behavior and resource consumption. Class meetings are divided between slide lectures, demonstrations, and site visits. Course work includes in-class exercises, homework assignments, and a comprehensive environmental assessment of a room in a building on campus.

L/L 535. (ARCH435) Structures I. (A) Farley. Corequisite(s): Arch 535.

Theory applied toward structural form. A review of one-dimensional structural elements; a study of arches, slabs and plates, curved surface structures, lateral and dynamic loads; survey of current and future structural technology. The course comprises both lectures and a weekly laboratory in which various structural elements, systems, materials and technical principles are explored.

L/L 536. (ARCH436) Structures II. (B) Farley. Corequisite(s): Arch 536.

A continuation of the equilibrium analysis of structures covered in Structures I. The study of static and hyperstatic systems and design of their elements. Flexural theory, elastic and plastic. Design for combined stresses; prestressing. The study of graphic statics and the design of trusses. The course comprises both lectures and a weekly laboratory in which various structural elements, systems, materials and technical principles are explored.

L/R 611. History and Theory III. (A) Furjan.

This is the third and final required course in the history and theory of architecture. It is a lecture course that examines selected topics, figures, projects, and theories from the history of architecture and related design fields during the 20th century. The course also draws on related and parallel historical material from other disciplines and arts, placing architecture into a broader socio-cultural-political-technological context. Seminars with teaching assistants complement the lectures.

631. Technology Case Studies I. (A) Falck.

A study of the active integration of various building systems in exemplary architectural projects. To deepen students' understanding of the process of building, the course compares the process of design and construction in buildings of of similar type. The course brings forward the nature of the relationship between architectural design and engineering systems, and highlights the crucial communication skills required by both the architect and the engineer.

632. (IPD 532) Technology: Designated Elective. (B) Faculty.

Several sections are offered from which students make a selection. This year's selections include: Space and Structure; Surface/Effects.

638. Technology: Special Topics. (B) Faculty.

Several sections are offered from which students make a selection. This year's selections are: Building Acoustics; High-Performance Building Envelopes; Building Systems; Lighting and Component Design.

671. Professional Practice I. (A) Steinberg.

This course consists of a series of workshops that introduce students to a diverse range of practices that architects currently employ and the architectural profession more generally.

672. Professional Practice II. (B) Steinberg.

A continuation of ARCH 671. Further study of the organizational structures of architectural practices today. The course is designed as a stimulating workshop that allows students and future practitioners the opportunity to develop the analytical skills required to enter the practice world. The course meets four times during the course of the semester.

772. Professional Practice III. (B) McHenry.

This course addresses the nature of architecture practices, requirements pertaining to professional registration, regulatory frameworks, contractual and legal responsibilities, professional ethics, firm management, marketing, and the stages of project delivery.

Graduate Electives

SM 711. (ARCH411) Topics in History and Theory I. (A) Faculty.

A seminar on advanced topics in architectural design and theory. Topics and instructors will vary.

712. (EALC158, EALC558) Topics in Architectural History and Theory II. (B) Faculty.

Several sections are offered from which students make a selection. Topics and instructors will vary.

SM 715. Seminar on Architectural Criticism. (A) Rybczynski.

The practice of architecture relies on the clear and effective communication of design ideas, to clients, reviewing agencies, the public, and other interested parties. This communication occurs not only through drawings, models, and verbal presentations, but often-especially in the early stages of a project-through the written word. The aim of this course is to train students in the principles and techniques of nonfiction writing as it relates to architecture. Readings will include different types of architectural prose, but you can only learn to write by writing. Writing exercises will include brief critical reviews of existing buildings and unbuilt projects, opinion pieces, and formal presentations of buildings and projects.

722. Drawing Elective. (B) Faculty. The making of architecture is executed through the reading of lines, mathematically described to indicate the boundaries and relationships of materials. Central to the act of drawing is the act of invention; illusion precedes realization. Line, surface, shadow, and perspective, explored through different media, are the language of inquiry. As a laboratory to test both analog and digital media, the intent of the course is to test how modes of can reveal the qualitative aspects of spatial propositions. The course is organized as series of loops between media, layering and capturing their intrinsic effects and intensifying the potential for new expression. A series investigations parallel discussions with artists and architects exploring representations of space and form; visits to galleries, museums and architecture offices provide a window into the relationship between the the instruments and media utilized to project built form and the preceding propositional representations. This course seeks to engage the intuitive and ephemeral with the highly precise, recognizing that the act and the artifact of transformation.

SM 731. Experiments in Structures. (A) McCleary.

This course studies the relationships between geometric space and those systems that amplify tension. Experiments using the hand (touch and force) in coordination with the eye (sight and geometry) will be done during the and observation of physical models. Verbal, mathematical and computer models are secondary to the reality of the physical model. However these models will be used to give dimension and document the experiments. Team reports will serve as interim and final examinations. In typology, masonry structures in in compression (e.g., vault and dome) correlate with "Classical" space, and steel or reinforced concrete structures in flexure (e.g., frame, slab and column with "Modernist" space. We seek the spatial correlates to tensile systems of both textiles (woven or braided fabrics where both warp and weft are tensile) and baskets (where the warp is tensile and the weft is compressive). we will examine Le Ricolais' structural models held by the Architectural Archives.

This course will study the classification of structural configurations in order to consider the significance of their dimensionality, directionality, axes of restraint and degrees of freedom. The taxonomy of braced frameworks in general and trussed beams in particular will be considered. There will be structural analysis of trusses using graphic statics and computer techniques. Students will either interpret a truss patented in the United States or experiment on the structure and geometric space of the braided tensile truss. Interpretations will include an explanation of the historical facts, built examples and a computer structural analysis; an evaluation of its efficiency in terms of strain energy for a given potential energy, and in comparison to A.G. Mitchell's minimum volume frameworks; an expression of the rational improvements that could be proposed.

732. Building Systems Integration. (A) Malkawi.

This course explores the interrelationships of environmental control systems by means of building type studies. Innovative systems will be emphasized. Projects such as residential, educational and commercial buildings, office and assembly buildings. The relationship between energy conservation and the principles of initial building cost versus life cycle costs will be discussed.

739. (HSPV551) Building Pathology. (M) Henry.

This course addresses the subject of building deterioration and intervention, with the emphasis on the technical aspects of deterioration. Construction and reconstruction details and assemblies are analyzed relative to functional and performance characteristics. Case studies cover subsurface conditions, structural systems, wall and roof systems, and interior finishes with attention to performance, deterioration, and stabilization or intervention techniques.

741. Contemporary Processes in Architecture: Experimental Design & Its Effects. (A) Rahim. The mastery of techniques, whether in design, production or both, does not necessarily guarantee the most advanced techniques can still yield average designs. Architects are becoming increasingly adept at producing complexity and integrating digital design and fabrication techniques into their design process - yet there are few truly elegant projects. Only certain projects that are sophisticated at the level of technique achieve elegance. This seminar explores some of the instances in which designers are able to move beyond technique, by commanding them to such a degree so as to achieve elegant aesthetics within the formal development of projects.

744. (IPD 544) Digital Fabrication. (B) Faculty.

A seminar and design workshop that explores associative and parametric CAD-CAM strategies, to enable an interactive continuity between conception and fabrication. Through parametric 3D constructions, students will explore how to link different aspects of the architectural projects, such as: (1) design intention; (2) control of variation and adaptation; (3) construction constraints; (4) digital fabrication processes. The course emphasizes the cross-fertilization of formal, technical and performative aspects of the design activity.

SM 745. Information Culture. (A) DiSimone.

Systems biology examines the nature of nonlinearities, emergent properties and loosely coupled modules that are the hallmarks of 'complexity'. New models and design in architecture have grown in response to radical breakthroughs in technology and an increasing interest in the use of algorithmic and generative tools within the design process. Algorithmic imaging and molecular tools found useful in analyzing nonlinear biological systems may therefore prove to be of value to new directions in design within architecture.

This course explores the potential of dialogues between architecture and nonlinear systems biology to gain insight into living systems, develop techniques for digital modeling, and create experimental designs with rigor at various length scales, from the microscopic to the human. Part seminar and part workshop, it serves to deepen knowledge of nonlinear biosynthesis, a synthesis of design thinking and tooling through the study of systems biology. Students will develop a series of digital and physical models through the use of a 3D printer and a diverse range of scripting and modeling techniques in parametric and associative software. The final assignment is a

748. Advanced Digital Media. (B) Faculty.

Technique: a method of accomplishing a desired effect. Media: the material/virtual means of transmission of the desired effect. This seminar will investigate specific media-based techniques and their latent ideologies through the analysis of selected paintings, photographs and films. Lectures and discussions of selected texts will examine how these techniques have impacted architectural culture in the modern period. A critical study of learned perceptions and conventions of seeing and of the media that stand between that which we believe to be real and the image will serve as the basis for creative investigations into depictions of space and material using digital media. By introducing themes that outline intersections between media-specific techniques and architectural practice, the course will enable the creative exploration of new methodologies and techniques related to digital media and its implications on the representation and formation of space. There will be a required presentation that will be developed into a final paper or project.

752. (CPLN760, UDES752) Case Studies in Urban Design. (B) Hack.

Through three case studies and a final project this course explores several fundamentally different ways in which the urban design process is realized in this country: The campus as historical prototype and contemporary paradigm; the new community both modernist and neo-traditionalist; expansion/relocation of CBD; and urban/suburban in-fill.

Particular emphasis is placed on the roles of planning, historic preservation and landscape architecture in the practice of urban design.

762. (ARCH462) Design and Development. (B) Rybczynski.

This course provides an introduction to the relationship between architectural design and real estate development. Following a discussion of fundamentals, examples focus on commercial building types, and illustrate how architectural design can contribute to real estate development. Topics include housing design, commercial buildings, adaptive reuse, downtown development, mixed-use projects, and planned communities. The course consists of lectures, reading assignments, short essays, a group project, and an mid-term test. Invited lecturers include architects and real estate developers. Readings consist of a Bulkpack available from Wharton Reprographics. There is one course text: Witold Rybczynski, "Last Harvest."

765. Project Management. (A) Arena.

This course is an introduction to techniques and tools of managing the design and construction of large, and small, construction projects. Topics include project delivery systems, management tools, cost-control and budgeting systems, professional roles. Case studies serve to illustrate applications. Cost and schedule control systems are described. Case studies illustrate the application of techniques in the field.

768. (REAL321, REAL821) Real Estate Development. (B) Nakahara. Prerequisite(s): REAL 721.

This course analyzes the development process in terms of the different functions performed by real estate developers and architects, and the interrelationships, between these two professions. Emphasis is placed on property evaluation site planning, building design, underlying economics and discounted cash flow analysis. Outside lecturers are featured.

780. Architecture in the Schools. (D) Braham.

Architecture in the schools is a 20+ year program of teaching architecture in Philadelphia area schools run by the American Institute of Architects. As a participant in the AIE (Architecture In Education) program students have the opportunity to work directly with children in the classroom making an impact on their lives and on the future of our neighborhoods and cities. Students work with a classroom teacher and a design professional to develop a weekly series of eight (1-1/2 hour) interdisciplinary experiential lessons using the built environment as a laboratory to create stimulating new ways of seeing, learning, and doing. Requirements for credit are attendance at all meetings and the submission of a brief summary report of the exercises that were used in the classroom.

790. Research in Architecture: Architectural Culture. (A) Turnbull.

This course examines the scope of research culture as it has developed in architecture over the past decade and as it evolves to address new conditions. The three central themes of the course are World Cities, Building Effects, and Mind-Bodies. These themes subtext from an economic and political analysis of globalization and encompass the ecological imperatives and opportunities related to the widespread use of digital media. Students will be required to write a term paper, document a process of rigorous research, or prepare a design that tests a hypothesis or demonstrates a proposition arising from a specific research agenda.

813. Qualifying Research. (B) Faculty.

This is an independent study course for first year Ph.D. and M.S. students, supervised by a member of the Graduate Group in Architecture. A course of readings and advisors sessions throughout the semester will result in an independent study paper, which will also be used as the student's qualifying paper for the Qualifying Examination. This research paper will be prepared as if for scholarly publication.

999. Independent Study. (D) Faculty.

This course enables student to undertake a self-directed study on a topic in Architecture, under the supervision of a faculty member. Students are required to make a proposal for the study to the Department Chair, outlining the subject and method of investigation, and confirming the course supervisor at least two weeks prior to the beginning of the semester.

Graduate Elective Programs

500. Summer Preparatory Design Studio. (L) Mitnick.

The Summer Preparatory Studio offers an intensive drawing and design experience to candidates for admission to the Graduate Program in Architecture who have not completed the necessary design studio prerequisites or who are required to have additional design experience to qualify for matriculation into the Master of Architecture Professional Degree Program in September. Enrollment in this program does not count toward the Master of Architecture degree.

The intent of the drawing component of the course is to familiarize the student with primarily black and white mediums (pencil, charcoal, ink, etc.). Exercises are designed to sharpen the student's ability to see selectively and to transform image to paper through both line and tonal renditions in freehand sketch form. Exercises will also familiarize the student with basic drafting skills necessary for architectural communication. The design part of basic three-dimensional design studies and simple architectural studio investigations are intended to build fundamental skills and acquaint the student with the architectural issues of form/space, conceptualization, transformation of scale, simple functional and constructional problems and a sensitivity to context.

674. (CPLN674, LARP674) Curricular Practical Training: Internship in Architecture. (L) Capaldi.

This class has been developed for Master of Architecture students who will be working for a licensed architect in a country other than their home country. The course develops critical thinking about the organization, operation, and ethics of professional practice in architecture. It also allows students to begin accumulating the training units required for professional licensure following the definitions developed by National Council of Architectural Registration Boards (NCARB) Intern Development Program (IDP). Course work includes on-line readings, discussions, exercises that focus on the work experience, and the submission of a summary report. Requirement: Student must be employed by a licensed architect for no less than 60 days.

782. (ARCH482) Study Abroad Program. (L) Castillo/Fierro.

A four to six week program of study in locations that vary, such as Paris, Japan and Mexico City.

Ph.D. Program

SM 811. Architectural Research. (A) Leatherbarrow.

This is a required seminar for first year PhD and M.S. students, but is open to upper level Masters students. This course will consist of a series of presentations by members of the Graduate Group in Architecture. The several presentations will address a common theme, and will demonstrate different methods or styles of research. Readings will come from professor's own writings as well as relevant texts from other scholars. Students will lead discussion sessions, write both synopses of several presentations and a longer text that compares the presentations. This course acts as a foundation for scholarly research and publication.

SM 812. Field Research. (B) Faculty.

First year Ph.D. and M.S. students will use this course to register for a research elective in their field of study. Courses to be taken will be selected from a list of electives offered by members of the Graduate Group of Architecture, typically the seminars offered by those faculty at the Masters level. At the outset of the course Ph.D. and M.S. students will discuss and decide with the professor the readings, research, and writings that will be appropriate for the course, given the student's field of study.

851. Dissertation Bibliography. (D) Faculty.

This course is essentially an independent study, undertaken by doctoral students in preparation for the Field Examination. This course should be taken in conjunction with ARCH 852 after all other courses have been completed. Normally a member of the student's Dissertation Committee supervises this course.

852. Dissertation Proposal. (D) Faculty.

This course is essentially an independent study, undertaken by doctoral students in order to write the Proposal for the Dissertation. The Proposal is prepared before and defended during the Field Examination. This course should be taken in conjunction with ARCH 851 after all other courses have been completed. Normally a member of the student's Dissertation Committee supervises this course.