School of Design Courses

Note on Course Numbers
Each Carnegie Mellon course number begins with a two-digit prefix which designates the department offering the course (76-xxx courses are offered by the Department of English, etc.). Although each department maintains its own course numbering practices, typically the first digit after the prefix indicates the class level: xx-1xx courses are freshman-level, xx-2xx courses are sophomore level, etc. xx-6xx courses may be either undergraduate senior-level or graduate-level, depending on the department. xx-7xx courses and higher are graduate-level. Please consult the Schedule of Classes (https://enr-apps.as.cmu.edu/open/SOC/SOCServlet) each semester for course offerings and for any necessary pre-requisites or co-requisites.

51-101 Design Studio I
Fall: 9 units
This studio course introduces students to the fundamentals of two- and three-dimensional design. Through a wide range of exercises and projects, students explore what it means to communicate with form and images. The course covers the uses of visual and physical elements in design, with emphasis placed on the idea and form development, visual organization, construction, understanding materials, and considering how people draw meaning from form. This course is for undergraduate design majors only.

51-102 Design Studio II
Spring: 9 units
This course is designed to provide a series of experiences that prepare students for a major in Industrial or Communication Design. Through the exploration of form and content, students begin to develop their abilities to design in more complex situations. This course seeks to develop perceptual and expressive abilities that allow for thorough interpretation of design problems. Students work as individuals and as members of teams to develop an understanding of design process. Student evaluation is based on faculty critique of projects at different stages of development in a studio setting, with the participation of students. This course if for undergraduate design majors only. Prerequisite: 51-101.

51-103 Design Workshop
Fall: 3 units
Design Workshop is a special course created for first year design students and serves as a supplement to primary studio and elective courses. In this course, students will explore design activities related to their core studio courses, receive special skills training, engage with guest lecturers, and attend field trips. Each class meets once per week.

51-104 Design Workshop II
Spring: 3 units
Design Workshop is a special course created for first year design students and serves as a supplement to primary studio and elective courses. In this course, students will explore design activities related to their core studio courses, receive special skills training, engage with guest lecturers, and attend field trips. Each class meets once per week.

51-122 Design Drawing II
Spring: 9 units
This course introduces drawing systems and diagrammatic conventions while further developing the principles covered in Design Drawing I. Exploration, analysis, refinement and communication of design concepts are the main issues covered in this course. Perspective systems and diagramming are used to understand, communicate and express various forms of information. Projects reinforce freehand sketching and provide the basis for introduction to more complex drawing media. Demonstrations, group and individual critiques reinforce concepts presented in class. This course is for undergraduate design majors only. Prerequisites: 51121. Prerequisite: 51-121.

51-132 Introduction to Photo Design
Spring: 4.5 units
Using a digital camera, students learn how to extend their 'seeing' with the camera, both in the world and in a shooting studio. Through shooting assignments student will understand how to: deconstruct image meaning and aesthetic choices, construction of photographic meaning and aesthetics, an understanding of color and how color delivers meaning, how a photographic studio works, proper digital photographic workflow and contemporary trends in photography. Intended for Design Majors, or permission of the instructor. Prerequisite: 51-101.

51-134 Photo Design II
Spring: 4.5 units
A continuation of Introduction to Photo Design Prerequisites: Introduction to Photo Design; 51-132.

51-171 Human Experience in Design
Fall: 9 units
This course introduces the central theme of design and the design professions: the importance of human beings in all aspects of design thinking and practice. We begin by exploring design and the human dimension, discussing the nature of human beings and their physical, psychological, and spiritual or cultural needs. Then, we consider the role of human beings in the design process, exploring how designers respond to human needs and issues of value. Finally, we discuss the scope of design in our personal, social, and cultural environment, observing how thoroughly design has permeated our lives through images, physical objects, services, and environmental systems, extending even to a profound impact on the ecological system of the planet. This course includes lectures, discussions, and written assignments, with readings and extensive visual materials. Required for all design majors.

51-172 Design Thinking
Spring: 9 units
This course uses the lens of sustainability to introduce you to the nature and history of design. The primary aim of the course is to introduce you to questions of what design can and cannot do, to the power and limitations of design in wider socio-technical contexts. The course reviews the wider conditions in which design takes place, such as resilient ecosystems and peak resource economics. It case studies moments in European and North American design history to determine the extent to which design is to blame for current levels of unsustainability in our societies, and the extent to which design can be our ‘savior.’ Through the course, you will examine various aspects of Design Studies, such rational problem-solving approaches to Design Methods, research of Design Expertise as reflective practice on materializing values, Material Culture Studies of designed artifacts and communications, Psychology of design-related social marketing and choice architecture and social research of everyday Socio-Technical Practices. The course involves one lecture a week, and one workshop a week; often informed by a reading. The assignments will get you to audit your personal ecological impacts and then information design them in order to identify opportunities for design-enabled change toward a more sustainable way of living and working. Open to Freshman across the university, though with priority to Design students. Prerequisite: 51-101.
**51-201 CD Studio I: Communicating with Type**

**Fall:** 9 units

This is the first studio for students in the communication design program. Students explore the fundamental principles of typography, where type is regarded as an image that serves a variety of communicative purposes. Projects allow students to explore issues of form and meaning, hierarchy, legibility and readability, structure and composition, and the design process. While typography is a highly focused branch of communication design, this introduction to typography as an image serves to open a path for students to study all facets of communication design in subsequent courses. Students use traditional and contemporary design materials and tools to communicate ideas visually. Special tutorials provide basic instruction in software such as InDesign and Adobe Illustrator. Key figures, philosophies, and technologies that have shaped typography are discussed throughout the course in context. The course also includes a demonstration of letterpress operation in the School’s Lab Press and a guided visit to the Hunt Library’s Rare Book Room. This course is for undergraduate Communication Design majors only.

Prerequisites: 51102

Prerequisite: 51-102.

**51-202 CD Studio II: Organizing Information**

**Spring:** 9 units

In this course students participate in a range of exercises, projects, discussions, and readings that are geared towards deepening their understanding of communication design and improving their skills. Course activities require students to consider and propose ways to inform, convince, question, and engage their audiences by clarifying and organizing information. Students deconstruct existing pieces of communication design, studying how their composition, type and image usage, and hierarchy reflects the content being communicated and the order in which it is read. Working in print and digital media, students study the similarities and differences among mediums and explore methods for effectively communicating information in each area. Students analyze design examples from the perspective of the maker and the receiver(s). This facilitates discussions that focus on the role of the designer in the communication of information. The course is for undergraduate Communication Design majors only.

Prerequisite: 51-201.

**51-203 Communication Design Computer Lab**

**Fall:** 3 units

This sophomore level Communication Design course introduces students to various software that designers use when creating communication pieces. Software is introduced in a way that coincides with the Basic Typography assignments, providing students with best practices that help them work efficiently and effectively. CD majors only, or permission of the instructor.

Corequisites: 51-201

Corequisite: 51-201.

**51-211 Generation of Form: Industrial Design I**

**Fall:** 9 units

Generation of Form is the first studio for students in the industrial design program. Students explore product aesthetics and basic formal issues as they pertain to industrial design. This course integrates the principles of three dimensional design, drawing and prototyping as they apply to the generation of product form. Emphasis is placed on issues that dictate the form of products and their creation. Students develop basic prototyping, conceptual drawing, and presentation skills for the purpose of exploring, analyzing, refining and communicating design concepts. Required of ID students; lab fee. Due to space constraints, this course is only offered to undergraduate Industrial Design majors.

Prerequisite: 51-101.

**51-212 Meaning of Form: ID Studio II**

**Spring:** 9 units

This studio course introduces students to the functional and expressive meaning of product form through creative exploration and decision-making in design. Functional product attributes include those that guide intuitive, safe, and comfortable use; expressive attributes include aesthetic, cultural, and contextual variables. Students are exposed to various methods of conceptual sketching, prototyping, and documentation to realize and communicate ideas in a process that anticipates human interpretation and response to design. Lab fee applies. This course is restricted to undergraduate Industrial Design majors only.

Prerequisite: 51-211.

**51-222 Decoding Place**

**Spring:** 9 units

This course will explore ways to decode, see, think and interpret the visual language of “place”. Through the intersection of found symbols, signs, images and color we will bring to light the function and purpose of our surroundings, and how they speak to natural and the built environment. During the course we will investigate the following question; How do we design visual systems which are understood by everyone, regardless of their language or culture but also work in harmony with natural systems? Students will work with traditional materials and tools as well as computers to understand the strengths and limitations of each, comparing their similarities and differences in the context of theoretical and applied projects. This course is for Communication Design majors only, or by permission of the instructor.

Prerequisites: 51-211 or 51-201.

**51-224 CD: Web Design**

**Spring:** 9 units

This is a lecture/lab that explores the processes and materials of the printing industry, followed by a dynamic, hands-on introduction to designing for the web. The first half of the course focuses on best practices in preparing digital files for printing and the various processes involved in applying ink to paper. Students are introduced to the affordances and limitations of printing processes and are shown how to properly prepare files with printing constraints in mind. The second half focuses on core skills in designing for the web, including basic instruction to HTML and CSS. Students investigate the technological limitations of the web and learn how to design within these constraints. Students are also introduced to HTML5, CSS3, and concepts of designing for divergent platforms including mobile phones, tablets and desktops. This course is for undergraduate Communication Design majors only.

Prerequisite: 51-201.

**51-227 Marks, Signs and Communications**

**Intermittent:** 9 units

In this studio course you will design a variety of marks ranging from trademarks, (logos), logotypes, icons, wayfinding devices and potential symbols. You will be exposed to many examples of marks for reference, acquire an understanding of the design process and develop the confidence of how marks fit into a communication strategy. This course is for undergraduate Design majors only, or by permission of the instructor.

**51-229 Digital Photographic Imaging**

**Fall:** 9 units

The objective of this course is to provide students with a practical, technical and theoretical foundation in digital imaging. The primary software for this course is Adobe Photoshop, with which students will explore construction, combination, manipulation of input, and output of image, and its use in narrative creation. Through project critique and other discussion, we will also consider the aesthetic and political implications of the emergence of this and other new electronic imaging technologies.

**51-231 Calligraphy I**

**All Semesters:** 9 units

Working with pure unadorned Roman letterforms, this course introduces students to the theory and practice of hand-generated letters, employing a variety of mark-making tools. This course provides an in-depth understanding of the basic principles and techniques of the art of formal writing. Rhythm, texture and composition are achieved through routine, elementary exercises using geometric forms, demanding concentration and manual discipline with the development of hand-eye coordination. The function, use, and harmonious sequencing of letterforms is taught through weekly projects. Awareness of rhythm, texture and letterform structure is achieved through routine exercises. Drills, demonstrations, discussions, individual and class critiques are on-going. Additional related topics and activities introduced in class include books: binding and design. A brief introduction to the historical development of our Western alphabet is provided through film, slides, demonstrations, with discussion of twentieth-century type designs. Students also gain experience to letter vocabulary, paleography, monotypes, words and punctuation, classical page design, publication design—past and present, and calligraphy's role in design today. Thinking with hands and eyes, the design, placement and spacing of letters practiced in this course awakens sensitivity and judgment in the designer.

**51-232 Calligraphy II**

**All Semesters:** 9 units

This course serves as a continuation and deeper investigation of topics explored in Calligraphy I, where students tackle advanced problems in calligraphy and lettering. The introduction of new hands is to be decided by the student and instructor. Prerequisites: 51231

Prerequisite: 51-231.
51-241 How People Work
Fall: 9 units
51241 How People Work: Human Factors (ID/CD Lab I) This course is a general introduction to the field of human-centered design and applied human factors. It centers on the understanding of physical, cognitive, and emotional human needs and desires, including methods employed to acquire this information and translate it into useful criteria for the design and evaluation of products. Lecture, discussion, lab exercises, and projects are employed. Required of all sophomore design students. Others admitted by permission of instructor only.

51-242 How Things Work: Mechanics and Electronics
Spring: 9 units
This course investigates the basic principles of mechanics and electronics. Through the combination of lectures, investigations, and lab experiments, students develop simplified representations of complex systems. The skills of freehand drawing, mechanical drawing and three-dimensional models are employed and developed during the project sequence. Required of ID students. Instructor permission required for non-ID majors. Prerequisite: 51-211.

51-243 Prototyping
Fall: 4.5 units
A half-semester laboratory mini-course introducing a range of materials, methods, and workshop techniques by which designers prototype designs in three dimensions. Basic competence in shop techniques is established by bringing to realization a series of simple artifacts. Studio and model shop tools are required; lab fee. This course is for ID majors only. Corequisite: 51-211.

51-246 Visual Communication Fundamentals
Spring: 4.5 units
Design elements are powerful tools for reaching your audience. The objective of this course is to help you understand how to use the fundamental visual tools of communication in your work, and to learn how to evaluate visual communication pieces you encounter in everyday life. Examples of design elements that we will explore are: type, color, format, images, text, pacing and sequencing. We will learn how to use these together to successfully communicate a portfolio of documented design work. This course is required for all ID sophomores. Prerequisite: 51-211.

51-251 Digital Prototyping
Fall: 4.5 units
A half-semester laboratory mini-course introducing 3D modeling software. Each class meeting consists of an introduction to and demonstration of specific aspects and functions of SolidWorks software. At the end of each class session, work related to the covered topic(s) will be assigned for completion by the next class meeting. This course is a requirement for all ID majors. Instructor permission required for non-ID majors. Corequisites: 51-211
Corequisite: 51-211.

51-257 Computing for the Arts with Processing
Intermittent: 9 units
This course is an introduction to Java programming for designers, architects, artists and other visual thinkers, using the popular “Processing” Java toolkit for interactive graphics. Intended for students with little or no prior programming experience, the course uses interaction and visualization as a gateway for learning the traditional programming constructs and the fundamental algorithms typically found in a first course in programming. Students will become familiar with essential programming concepts (types, variables, control, user input, arrays, files, and objects) through the development of interactive games, information visualizations, and computationally-generated forms. Because of limited space, only Design majors may take this course.

51-261 Communication Design Fundamentals
Fall: 9 units
A one-semester course that introduces non-majors to the field of communication design. Through studio projects, lectures, and demonstrations, students become familiar with the visual and verbal language of communication designers, the design process, and the communicative value of word and image. Macintosh proficiency required. This course is required for HCI double majors and Design minors. Section W - Qatar campus only.

51-262 Communication Design Fundamentals
Spring: 9 units
A one-semester course that introduces non-majors to the field of communication design. Through studio projects, lectures, and demonstrations, students become familiar with the visual and verbal language of communication designers, the design process, and the communicative value of word and image. Macintosh proficiency required.

51-264 Industrial Design Fundamentals
Spring: 9 units
A one-semester course that introduces non-majors to product development from the industrial designer’s point of view. Through studio projects, lectures, and discussions, students will gain experience in visualizing a product for mass production. Case histories and the analysis of existing products will supplement hands-on experience in developing product concepts. This course is required for all ID minors.

51-265 Black and White Photography I
Fall: 6 units
Introduction to the methods and practices of black and white photography, including darkroom practices. 35mm camera required; lab fee.

51-271 Design History I
Fall: 9 units
This course provides an overview of design history from 1850 to 1950, the critical period for the formation and development of design and the design professions. There are three primary goals. The first is to provide an understanding of the role that design has played in the evolution of the competitive free market system at national and global levels. The second goal is to demonstrate how design emerged as a powerful tool for corporate and cultural identity in this period. The third goal is to develop an understanding of some of the basic influences on the formation of design theory and practice in the twentieth century. This is accomplished through the presentation and discussion of primary economic and cultural forces, philosophical ideas, artistic and social movements, and significant individuals and artifacts that represent the period. The course traces both the chronological and the contextual development of design, providing students with an understanding of design as an evolving concept. This course is required for Design majors and Design minors.

51-272 Design History II
Spring: 9 units
This course focuses on the development of design from 1950 to the present, with further exploration of the themes introduced in Design History I as well as the introduction of new themes that have emerged to influence the direction of design thinking. The themes range from design for communities, to personal visions of individual designers, to the needs and expectations of society. The course explores the relationship between design and gender, race, the environment, political systems and social change. Students develop an in-depth understanding of these themes through lecture, research and presentations. This course is open to Design majors, BHA Design students, Design Minors, and by permission of the instructor.

51-274 Design and Social Change
Spring: 9 units
In this course we will examine the important relationships of history, culture, policies and the environment in communication design and industrial design. Conversely we will study the ways in which design can affect our culture and environment, both positively and negatively. Topics include: sustainability, universal design, system design and system visualization. While various cultures will be acknowledged and discussed, the major emphasis will be on Western culture. Through lectures, videos, reading and projects, students will develop their ability to incorporate historical context and consideration of potential consequences into their design process.

51-301 CD III: Voice of Type
Fall: 9 units
This course develops advanced skills in typography and communication design, including the study of type and motion. Students learn to conceptualize and visualize more complex bodies of information for a variety of communicative purposes. Projects encourage students to develop a deeper understanding of the expressive potential of type and image and to develop critical and creative thinking skills with which to assess the effectiveness of their own work and that of their peers. Course objectives are to encourage an active exchange of ideas and information which allow students to develop the ability to clearly articulate their ideas and thought processes in relation to their work. This leads to a more focused method for developing and expressing ideas effectively. Instructor permission required for non-CD majors. Prerequisites: 51202
Prerequisite: 51-202.
51-302 CD Studio IV: Designing with Systems
Spring: 9 units
As the final course in a sequence of typography courses for Communication Design majors, this one builds on everything learned previously. The course focuses on creating a system for dealing with large amounts of content, either self-generated or found, in print and digital platforms. The differences and similarities between traditional and new platforms of delivery provide students an understanding of where new forms of communication may be heading, given the rise in mobile devices that allow for downloading of content. Topics may include systems for the delivery of typography, images, movies, music, sound, and motion, as well as screen design and navigation. This course is required of Communication Design majors in the School of Design. Prerequisite courses include Type III, Type II, and Type I.
Prerequisites: 51301
Prerequisite: 51-301.

51-311 Product Design ID III
Fall: 9 units
Course projects are chosen to give students an opportunity to use their creative, technical and theoretical skills in a business application. The primary emphasis is on the use of a systematic process for the design and development of products that are useful, usable, desirable and feasible. Attention is also given to designers’ interaction with engineering, marketing, and other professionals who influence the product development process. Studio, model shop tools and use of digital tools, such as 3D computer modeling, digital sketching, etc. required; lab fee. Instructor permission required for non-ID majors.
Prerequisite: 51-212.

51-312 Products in Systems: ID IV
Spring: 9 units
This course introduces the themes of product planning and the development of products within systems and as systems. The projects are broad in scope and require students to develop products that reflect an understanding of the entire development cycle. Tools and skills for the studio and model shop are required; lab fee. Instructor permission required for non-ID majors.
Prerequisite: 51-311.

51-316 Designing Spaces
Intermittent: 9 units
Stop. Look around you. Where are you and what are you doing? Are you in a lecture hall? A gallery? The check-out line at the “O”? Or it the light primarily artificial, and what are the fixtures like? What, in sum, does it feel like to be in this space and what are the elements that define it? This course will present you with the opportunity to consider some of these questions, and will allow you to look at spatial issues from your perspective as a designer. The semester will be divided into sections exploring issues such as program, site, structure, material, and light, and each section will be supported by a series of exercises, lectures, and short projects. Designing Spaces should be of particular interest to those interested in pursuing exhibit design, interior design, and wayfinding design, but it may also be useful simply as a way of expanding your design framework. This course is open to junior and senior ID and CD students, and has no prerequisites.

51-319 Digital Photography in the Real World
Intermittent: 4.5 units
DIGITAL PHOTOGRAPHY IN THE REAL WORLD Photographers are active observers. They look until they see what they want others to see — then they compose and click the shutter. In this course students will walk streets with their cameras. They will learn how to use their cameras to better understand what they believe is important, beautiful, and/or intriguing in the world. They will also learn how to communicate their imagery to others through screen-based and print output. Assignments range from accurately describing reality, to showing aspects of life that should be improved, to making images for purely aesthetic reasons. There are two main goals to this course: learning the fundamentals of operating a digital camera and producing digital output; and, learning to become better “seers” in the world. Students must own a camera but no prior photographic experience is necessary.

51-321 Photographic Narrative
Intermittent: 9 units
Most photographs tell stories. We see photographs in newspapers, magazines, snapshot albums, on the web, in books, and in posters. In these contexts photographs often work with words to convey meaning, whether they are shown with captions, news stories, or just with titles. Photographs can work without words, too, to create purely visual narratives. In this course, students will make a photo narrative and determine how it will be seen. Students may make photo books, for example, or decide that their images will be seen digitally on screen. While students are making photographs, we will explore the rich traditions of photographic story-telling that range from the world-oriented work of photo-journalist W. Eugene Smith to the documentarians such as Walker Evans, Nicholas Nixon, and Alec Soth. We will look at photographers, too, who construct fictional worlds, such as Duane Michals, Cindy Sherman, and Gregory Crewdson. As students make their own narratives, we will look at the interplay between words and photographic images; how images are paced and scaled to create rhythm; how photographs are sequenced to tell stories; and other formal elements involved in creating visual narratives.
Prerequisite—a college level photography course.
Prerequisites: 60-141 or 62-141 or 51-134.

51-322 Advanced Digital Photography
Intermittent: 9 units
Graphic identity In this studio course we will evaluate how effective graphic identity programs convey the character and spirit of the organizations they represent. We’ll explore how successful identity programs invite expression throughout the organization, and across media. A series of rapid and intensive projects encompassing positioning, logo/symbol design, and innovative identity extension and expansion will give you first-hand experience with the creative — and diplomatic — challenges of designing effective identity.
Prerequisite: 51-301.

51-323 Drawing and Communication
Intermittent: 9 units
This course explores drawing as a means of communicating and expressing ideas. We will explore drawing by hand, but there will be some integration of other imaging technologies. Themes will center around objects, people, and places in various contexts. Emphasis is placed on individual interpretation and exploration of the assigned projects. Each project has several components that cause the student to generate and develop ideas as they work towards more refined images. Specific conceptual and technical skills will be discussed both individually and in groups as students examine the relationship between images and meaning. Instructor permission required for non-Design majors.
Prerequisite: 51-122.

51-324 Basic Prototyping
Spring: 4.5 units
A half-semester laboratory mini-course introducing a range of materials, methods, and workshop techniques by which designers prototype designs in three dimensions. Basic competence in shop techniques is established by bringing to realization a series of simple artifacts. Studio and model shop tools are required; lab fee. Instructor permission required for non-CD majors.
Prerequisite: 51-201.

51-325 Signs/Symbols/Marks
Intermittent: 9 units
This course focuses on the formal development of pictorial signs (icons, symbols, marks, etc.) either as individual elements or as families and systems of compatible forms. Through a variety of projects, students will employ an analytical process, which includes research, observation, idea generation, development, selection, and refinement of images. We will explore the personal, social, and cultural messages that such images carry. There will be applications in two- and three-dimensional formats. Instructor permission required for non-Design majors.
Prerequisite: 51-202.
51-326 Photography & Family
Intermittent: 9 units
Picturing Families at Sojourner’s House In this course we will partner with Sojourner’s House to tell photo-based stories of the residents. Sojourner’s House (SH), located in East Liberty, is a home for women and families who have faced obstacles of addiction and homelessness. Those at SH have lived through hard times. The women, some of whom are mothers, are now ‘clean and sober’ but before they came to SH, they were addicts who lived strained lives. As a class we will be working with women and families who now are creating positive change in their lives through Sojourner’s House supportive environment. Students, working in pairs, will team with individuals or families. Through weekly sessions, students will explore how the camera can be used to tell a range of different stories, which may range from a traditional photo documentary, to a narrative that is ‘directed’ by a student with photographs made by Sojourner’s House residents. Students may work with children to show their day-to-day life, they may work with an individual woman to tell the story of her dreams; or they may choose to work with staff at Sojourner’s House to explore why someone goes into this line of work, to name a range of examples. Students will learn how to sensitively work with people who have experienced extreme difficulty while they are learning about addiction through readings and first hand accounts. While they are getting to know their subjects, students will explore the various ways to create an in-depth photo narrative. Most important, students will learn how the camera can be used to create connections and trust between people. Prerequisite: A college level photography course 12 students — sophomores to 3rd year juniors.

51-327 Introduction to Web Design
Fall: 9 units
This class will introduce the basics of designing and building websites, as well as the fundamentals of HTML5 and CSS3, to assist students in creating semantically sound web pages that can be viewed across a variety of platforms, devices and browsers. The class will help students understand the constraints and advantages of working with the web as compared to traditional print media. Students will also be introduced to content management systems and topics such as responsive web design, research, and information architecture. Upon completion, students will be capable of designing, creating, and launching their own web sites. Your own laptop is required, with the following software installed: Adobe CS 5 or later. This course is for Design Majors only, or by special permission of the instructor.

51-328 Advanced Web Design
Intermittent: 9 units
Advanced Web Design builds on the fundamentals of Introduction to Web Design to make students more sophisticated web designers. Focusing on the web as an interactive multimedia platform, this course will delve more deeply into web research and strategy, content development and style, engine optimization, and introduction of PHP and Javascript. Students will also gain a basic understanding of databases, work with content management systems, and design and develop for divergent platforms such as phones, tablets, and desktop computers. Students will be introduced to content management systems and topics such as building websites while mastering HTML5 and CSS3, as well as gaining exposure to scripting and PHP. Intro to Web Design (51327) is a prerequisite for this course. Prerequisites: 51327
Prerequisites: 51-327 or 51-224.

51-330 Photo Book Design
Intermittent: 9 units
The Photo Book: Photographers are often made into books. In this course, students will make photographs with the intention of presenting them as a book. We will deal with theme and content, image sequence and size, and the use of text with image. In addition to making their own, students will learn how the camera can be used to create connections and trust between people. Prerequisite: A college level photography course 12 students — sophomores to 3rd year juniors.

51-331 Advanced Calligraphy I
All Semesters: 9 units
This course serves a continuation of study in the discipline of calligraphy. (It meets at the same time as Calligraphy I) Students may take one or two directions in the course. (1) Enlarging their repertoire of scripts, contemporary or traditional, for use in limited areas of work such as book or display work; or (2) Concentrating on more intensive problem solving using a limited repertoire of scripts such as Roman, Italic, Sans Serif. Prerequisites: 51232
Prerequisite: 51-232.

51-332 Advanced Calligraphy II
All Semesters: 9 units
This course serves a continuation of study in the discipline of calligraphy. (It meets at the same time as Calligraphy II.) Students are encouraged to tackle advanced problems or work with the instructor to determine new directions of study. Prerequisites: 51331
Prerequisite: 51-331.

51-333 Poster Design
Intermittent: 9 units

51-334 Type and the Package
Intermittent: 9 units
This course is for Design Majors only, or by special permission of the instructor.

51-336 Mapping and Diagraming
Fall: 9 units
This course explores the different ways in which we communicate complex information, through maps and diagrams. Students will design maps and diagrams using subject matter of their choice. Instructor permission required for non-Design majors.
Prerequisite: 51-301.

51-337 Letterpress in a Digital World
Intermittent: 9 units
What value does the antiquated process of letterpress printing have in our current digital world? What can we learn from the process that was used as the primary form of reproducing the printed word for nearly 500 years? As designers and artists, we have the opportunity to re-examine an obsolete mode of commercial printing, and explore how these techniques and technologies can add to our experience, expand our repertoire, and invigorate our working process. Our goal in this course is to seek out new opportunities in expression, resulting from the harmonious merger of new and old technologies. Intended for design juniors and seniors.

51-338 Documentary Photography
Intermittent: 4.5 units
Documentary Photography: the Social and Built Landscape Documentary photography explores issues, often social, humanitarian and/or political, in man-made culture. This course examines the work of nineteenth, twentieth, and twenty-first century documentarians while students photographically investigate their own topics. Among the many ethical areas of a documentarian’s concern, the course examines (through looking at the documentary tradition and through the student’s own work) the following: the photographer’s relationship to the subject; the choices involved in representing the subject; the act of selectivity in framing the subject; the reasons for making documentary photographs; the intended audience for documentary photography; and the appropriate final display of the photographs? Extensive shooting, printing, and library research. Prerequisite: A beginning photography course, or by the permission of the instructor.

51-341 How Things are Made
Fall: 9 units
How Things are Made This course will provide a breadth of knowledge for current manufacturing, materials, and processes encountered in the industrial design field. There will be an emphasis on actual production/ manufacturing methods and not rapid prototyping methods. The class will consist of various lectures, media, electronic tools, and on-site visits to enable an understanding of how mass production affects design and design decisions. Industrial Design juniors or permission of the instructor.
51-342 Projects in Human-Centered Design  
Spring: 9 units  
This course presents an opportunity to experience and understand the human centered research and design process through a self-defined project. Projects flow from a common sequence of exploratory human and product research, concept generation using participatory and co-design methods, and user feedback to evaluate emerging design concepts, as they are refined. Course format includes lecture, discussion, lab exercises, interim presentations, a final presentation and thorough documentation of the research and design process. Open to all juniors and seniors in Design. All others will be waitlisted and admitted by permission of the instructor.

51-343 Digittech Design Tools  
Fall: 9 units  
This course is the application and experimentation of digital technology inputs and outputs. The purpose will be to design, build, and experiment with forms that are unique to computer controlled rapid prototyping. The combination of 2-D and 3-dimensional computer modeling and the dFab Lab facilities’ rapid prototyping equipment will provide the means and method for output and project work. This course is a Studio and Lab course structure. Prerequisites: 3D solid modeling or 3D surface modeling experience REQUIRED. This course is intended for junior and senior Industrial Design majors, or by permission of the instructor. Prerequisites: 51251 or 51344.  
Prerequisites: 51-324 or 51-243.

51-344 Advanced Digital Prototyping  
Spring: 6 units  
This course is an advanced course using SolidWorks computer modeling. It is a prerequisite for Production Prototyping. Prerequisite: 51-211.

51-345 Pragmatics of Color for Non-CD Majors  
Intermittent: 9 units  
Pragmatics of Color for non-CD majors Throughout the course, we will explore the application of color and its' use through many different medium, products and environments. We will use a variety of source materials like pigment, colored paper, and photography. These exercises will help us to explore how the different medium affect color perception. Because color is extremely dynamic and interactive, a good deal of emphasis will be placed on your ability to iterate many variations so that comparison becomes the point of discussion and learning. Equally important, is increasing your sensitivity to the nuances of color through direct observation and experimentation. The class exercises are distinctly different in nature from one to the next; they are organized in order to build upon each other. Prerequisites: you must own a digital camera and have previous experience with Photoshop and Illustrator.

51-346 Production Prototyping  
Spring: 6 units  
This course is the 2nd half of Advanced Digital Prototyping, using your work in SolidWorks to produce hard models. Prerequisite: 51-311.

51-347 Drawing from Nature  
Intermittent: 9 units  
Drawing From Nature This course is about observing and making images of things growing, crawling, flying, swimming etc. Observations will be made firsthand in the field, supported with relevant research in topic areas with the aim of deepening personal understanding of all things biological, issue surrounding natural forms such as behavior, locomotion, adaptation, the environment and systems will also be investigated. We will work in tandem on refining our abilities in communicating what we discover through the process of drawing. A variety of visualization methods will be covered i.e. analytical drawing, visual notes, and diagramming to name a few. We will be using a variety of basic drawing and digital media to develop our work as we uncover aspects of form, structure and surface. Guest speakers will present work they have done in areas such as botany, biology, and environmental studies to name a few. A majority of the work will be done in the field and will then be developed in the studio. A final project will be assigned that will challenge you to develop a concept along with a compelling form(s) that communicates what you have uncovered about nature to a variety of audiences. This course builds on your experiences from First Year drawing and introduces several more advanced visualization methods. This course is intended for Junior and Senior Design Majors.

51-349 Visual Notation/Journaling  
Intermittent: 9 units  
Visual Notation Visual notation is the graphic equivalent of taking written notes. While the camera is a valuable and at times indispensable tool for recording what we see, however, the camera cannot make visible mental concepts. Nor can it discover and display underlying structures, create hierarchies, explain organizational schema or concepts that are not easily seen or understood. This course is about making visual notes in order to become fluent in our abilities to observe, record and interpret. Through daily entries in a journal students will work in several content areas i.e. mapping, natural and built environments and systems to name a few. A good portion of the work in this class we be conducted in the field using the resources available to us such as the museum, zoo and archival sites. You will also be challenged to incorporate your notes as tools for communicating design concepts, implementing project development and presentations. The course will rely on the use of a variety of simple drawing tools and electronic media. Several visualization methods will be introduced and the work will build on the drawing experiences from First Year drawing. This course is intended for Junior and Senior Design Majors.

51-350 Visualization  
Intermittent: 9 units  
This course introduces methodologies for visualizing, recording and presenting ideas. With an emphasis on creating visual narratives, students will 1. engage in activities of field notation, journaling, storyboarding, and “hot-house” conceptualization; 2. gain exposure to advanced rendering techniques using markers, chalk pastels, and adobe illustrator/photoshop; 3. appreciate the qualities and characteristics of visual media, sensitivity of representational perspective, form building, and media, sensitivity of representational perspective, form building, and experimental. Specific conceptual and technical skills will be discussed both individually and in groups with emphasis placed on individual interpretation and exploration of the assignments with the goal of developing visual fluency. A part of the course will be spent looking at how designers have used drawing in the design process at various times through history and within a variety of contexts. Emphasis is placed on craftsmanship and more on the role drawing may play in the complex process of visual thinking and notation. Consistent with the credits allocated to this course a total of 5 hours of work, both in and outside of class, will be expected each week. A portfolio of work will be expected the last day of class. Instructor permission required for non-Design majors.

51-351 Drawing, Expression and Communication  
Intermittent: 4.5 units  
Drawing, Expression and Communication This course explores the use of drawing as a means of visualizing, communicating and expressing form, space and ideas as a foundation for the application of ideas. We will discuss, analyze and apply concepts related to the use of drawing as a thinking tool and as a means of communication. Students will use freehand drawing and computer generated techniques to communicate design concepts, implementing project development and presentations. The course will rely on the use of a variety of simple drawing tools and electronic media. Several visualization methods will be introduced and the work will build on the drawing experiences from First Year drawing. This course is intended for Junior and Senior Design Majors.

51-352 Projects in Human-Centered Design  
Spring: 9 units  
This course presents an opportunity to experience and understand the human centered research and design process through a self-defined project. Projects flow from a common sequence of exploratory human and product research, concept generation using participatory and co-design methods, and user feedback to evaluate emerging design concepts, as they are refined. Course format includes lecture, discussion, lab exercises, interim presentations, a final presentation and thorough documentation of the research and design process. Open to all juniors and seniors in Design. All others will be waitlisted and admitted by permission of the instructor.

51-353 Writing & Photography: Magazine Writing & Journalism  
Intermittent: 9 units  
This course explores the use of writing as a means of visualizing, communicating and expressing form, space and ideas as a foundation for the application of ideas. We will discuss, analyze and apply concepts related to the use of drawing as a thinking tool and as a means of communication. Students will use freehand drawing and computer generated techniques to communicate design concepts, implementing project development and presentations. The course will rely on the use of a variety of simple drawing tools and electronic media. Several visualization methods will be introduced and the work will build on the drawing experiences from First Year drawing. This course is intended for Junior and Senior Design Majors.

51-354 Experimental Sketching  
Intermittent: 4.5 units  
Experimental Forms of Sketching fall 2011 Advancing design drawing philosophy and application This 7 week mini course seeks to expand our experiences with interpreting forms of drawing quality within the process of sketching. This approach will explore semantics of rendering with mixed media, sensitivity of representational perspective, form building, and sequence evolution, within drawing developments that stimulate emotional connections with a viewer. Through exploring and testing variables, we will use the nature of drawing behavior processes to expand the interpretive significance of abstract idea forms. These “drawing idea forms” will be represented throughout a range of abstract levels from literal to highly figurative. Interpretations will derive from a variety of themes involving design, life, and nature and expressed on paper as objects, scenes, and story persuasions.
51-357 Stuff That’s Optional: People at Play
Intermittent: 9 units
Stuff that’s optional: People at play Unlike our necessary work that provides sustenance for self and dependants, our recreation is optional and chosen. Products that support recreation are, likewise, an option. Soccer balls, kayaks, daypacks, fly reels, chess sets, running shoes; for that matter, the entire recreational industry is based on election. Our lives are better off for it; play is good for us. In this studio/project course we will investigate play as an aspect of human endeavor. There are readings, discussions, and sessions aimed at gaining an understanding of the field. We will then respond by searching out and framing design opportunities, ideate and propose, refine and test. We will make stuff as teams and individuals that help us further define what it means to be humans at play. This course is intended for Junior and Senior Design Majors.

51-359 Prototyping Tools for Embodying UX Design
Intermittent: 9 units
The course intent is to develop appropriate user experience of tools and technology for a projected time frame or context of use. The need to understand people’s stories, their lives, and how they want to live determines what interfaces, products, and systems should be developed. Student teams will work together to create appropriate user interactions and experiences which are supported by the design of tools and/or technology. This integrated course will utilize rapid prototyping as the basis for the creation of these proposed tools and products. This course is intended for junior, senior, graduate level students. Non-Disclosure Agreement and other legal agreements may be part of the requirements. Proficiency in one or more of these visualization methods: freehand sketching, computer visualization in 2D graphics, motion graphics and/or 3D solid or surface modeling. By Instructor Approval if NOT in Design. Please forward statement of intent to Instructor.

51-371 Design & Social Change
Intermittent: 6 units
Social change can be described as any event or action that affects a group of individuals that have shared values or characteristics. It could also include acts of advocacy for the cause of changing society in a normative way (subjective). Through reading, writing, discussion and projects, this course will touch on a variety of current issues such as diversity, sustainability, accessibility. Students will apply design thinking to social issues, and learn to incorporate these considerations into their design process. Because this course only meets once a week, attendance and participation is a vital part of this course. This course is intended for Design juniors. Design Minors who have completed Design Fundamentals will also be considered.

51-373 Design for Good
Intermittent: 9 units
This seminar-in-action will investigate and explore the responsibility of the designer as an agent for social change and development. We will critically examine theoretical readings, case studies, institutions and initiatives from a diversity of interdisciplinary perspectives encompassing economic, socio-cultural, political, ethical, technical and aesthetic factors. These broad survey investigations will then inform the rapid creation of design interventions, artifacts and provocations in response to our collective discoveries. Structured as one seminar and one action lab per week, students will throughout, closely document their thinking and designing in action, as a meta-lens on their own emergent role as a designer, researcher and change-maker.

51-374 Understanding Perception through Design
Intermittent: 9 units
Understanding Perception Through Design 51-374/51774 This course emphasizes audience expectations, also known as schemas, as a major influence on the artifacts we produce. For example, we read marble Corinthian columns as an entrance to a courthouse rather than to a home. The manner we use to communicate, either following or deviating from expectations, affects the way people perceive and process the information we present. Through lectures, discussions, readings, and projects, we will study the use of schemas in both print and digital mediums. We will also explore the bearing of expectations on the types of interactions and experiences we produce. As part of the course: Can information become concrete and experiential versus abstract and readerly? Instructor permission required for non-Design majors. Prerequisites: 51-301 or 51-311.

51-375 Meaning in Images
Intermittent: 9 units
Images abound in our culture. This course takes a critical look at many different kinds of photographic images to understand how they operate in our culture to inform, persuade, and entertain various audiences. The content for this course will be generated from looking at, thinking about and discussing issues discovered while studying well-known to lesser-known images that range from photographs used in ad campaigns, to photographs that are used in scientific representation, to snapshots in family photo albums, to photographs that are used to show social injustices, to photographs that exist in museum collections. Readings will be assigned and short writing exercises will be required throughout the semester. In addition, photography assignments will be given. Design majors will have preference. Requirement: a digital camera. 15 students, junior and senior Design Majors.

51-376 Topics: Semantics & Aesthetics
Intermittent: 9 units
51376 (undergrads) 51876 (grads) Aesthetics & Design The course will explore the principles of visual composition, proportioning systems and the rules of order as it relates to art, architecture and design. The class will involve extensive reading and discussion of these topics in class. Some project work will also be required but minimal to the reading. A reading list will be provided. Instructor permission required for non-Design majors.

51-378 History of the Book and Printing
Intermittent: 6 units
History of Books and Printing 51278 A survey of the materials and techniques used to make books covering manuscripts, calligraphy, printing, presses, type design, readers, illustrators, graphic techniques, and even e-books examined using a variety of tools: real rare books, readings, discussion, in-class exercises, essays & quizzes.

51-379 Information + Interaction + Perception
Intermittent: 9 units
As a society, we’re inundated with enormous amounts of dense information on a daily basis. In fact, many of us have grown so accustomed to the abundance of information in our lives that we expect and need it to be accessible virtually anywhere and anytime. Technological advancements, which seem to develop at lightning speed, continuously provide us with tools that make it easy for us to access information quickly. However, little is being done to aid people’s understanding of information that is increasing in complexity. Why? Our addiction to accessible and thorough information has caused many of us to turn a blind eye to the perceptual problems associated with its speedy delivery. In this course we will investigate contemporary visualizations of information and the bearing of their forms on the quality of communication. We will also study how peoples’ perception of content, interaction with others, belief systems, and mental and physical well being can be affected by the visual communication of information. Thus, although we CAN represent information various ways we will ask how SHOULD it be designed to aid people’s understanding of it. Your explorations will take the form of analyses of existing artifacts; class discussions and exercises; short, relevant readings that originate in various disciplines such as cognitive science, architecture, learning science, and design; and corresponding projects that enable you to illustrate what you’re learning.

51-380 Experiential Media
Intermittent: 9 units
Experiential Media Design focuses on the theory, methodology and history behind the design, development and interpretation of experiential media systems. The class incorporates a multidisciplinary approach to the study of complex media systems as technological, political, economic, socio-cultural and personal experiences. Topics covered include media and communications theory, cultural studies, qualitative and quantitative methodology, design principles, human-computer-interaction, information visualization and representation, user studies and evaluation. Students will create and critique a variety of integrated media systems demonstrating technical competence, aesthetic knowledge, analytic rigor and theoretical relevance. This class is open to Junior & Senior Design Majors, and others by permission of the instructor.
51-382 Framing a Project
Intermittent: 9 units
Framing a project is a complex yet rather simple activity. Get it right by thinking through the variables and you can set yourself up for an interesting exploration and discovery process. Get it wrong, or more likely just loosely piece it together, and you can waste time going over the same issues, and not working towards your desired goal. In this seminar course, students will design a major project of study or exploration. It is essential that they have a project idea in mind, as this will be the focus of the course. Through a series of seminars and individual tutorials we will investigate ways to integrate your area of interest academically within the context of longer-term work or research goals, as well as your current levels of expertise and interest. This course is suited to Graduate Students or advanced Senior students working towards a major project.

51-383 Topics: Conceptual Models
Intermittent: 9 units
As design problems become more complex, conceptual modeling becomes critical in design process, especially when designing for the abstract concepts such as interaction, experience, service, and systems. Creating conceptual models are often an important step for making the creative leap from user research findings to design implications, which is one of the core challenges in design process. Conceptual Models are also effective tool to bring in shared understanding for different stakeholders in teams with multidisciplinary team members, user-participants, and clients. Moreover, these conceptual models often directly lead to final information products to support users to learn how to use complex systems. Conceptual Models is a full semester course that provides students with the opportunity to explore theories related to conceptual models and to improve skills in using them as a means of design. Being primarily developed for graduate and undergraduate students in Design, this course consists of two parts. The seminar part of the course will provide students with readings, examples, and in-class discussions to help them understand the nature of conceptual models. The project part of the course will provide an opportunity to apply these theories to actual projects. Students will work in individuals and teams to create conceptual models for different needs and goals in design process.

51-384 Revealing Place
Intermittent: 4.5 units
Revealing Place is a documentary photography class where students will use their cameras to explore a group, idea, and/or location and tell its story. Students will use photography as a way to engage community, document social phenomenon, and define what’s happening at that moment in the history of their chosen setting.

51-385 Design for Service
Intermittent: 9 units
Designing for Service is a full semester course to provide students with the opportunity to explore the philosophical ground of service design as well as the opportunity to practice embodying its perspectives, models, and theories to project process. Being primarily designed for graduate and undergraduate students in Design, this course consists of two parts. During the first part of the semester, students will be provided with readings from diverse related fields and asked to participate in discussions in order to gain a deep understanding of the nature of service, the methods used for service design, the natural human experience when they interact with service products, and diverse perspectives on the products of service to broaden their understanding on the role of designers in our society and culture. During the later part of the semester, students will be asked to work on service design projects in teams.

51-387 Information and Interaction
Intermittent: 4.5 units
Despite recent technological advancements, the representations of dense bodies of information still overwhelm viewers by requiring them to spend lots of time and energy deciphering content, while providing them little feedback on their accomplishments. Designers often give viewers a few options for organizing information. However, the content frequently remains fixed, enabling little input from viewers. In this class we will investigate the use of visuals, sound, and motion as tools for representing information that engages viewers in enjoyable, participatory processes of exploration and discovery. Throughout the mini-course we will explore dynamic information design from the viewer’s perspective by discussing their desires and expectations. We will explore strategies for developing appropriate representations of content, the value of patterns to deciphering the meaning of information, the importance and value of entry points, and sharing in the role of the focus in setting the stage for fulfilling experiences. Instructor permission required for non-Design majors.

51-388 Sharing Economies
Intermittent: 9 units
This topic course explores the nature and practice of sharing. The course is a survey of cultural theories about why and how we do and don’t share and the difference design can make to systems of sharing. It explores philosophies and anthropologies of sharing, distinguishing sharing from giving, lending and exchanging. It interrogates psychologies and histories of ownership, and notions of privacy. The course also explores the range of new systems that promote sharing in the contexts of the new socially enabled by the social media and cosmopolitan urban living. It investigates the role of politics, such as concerns about ecological sustainability, and the role of perceived autonomy and convenience. By the end of the course, you will have a more comprehensive understanding of what facilitates and constrains sharing, and so be in a better position to design systems that promote increased resource productivity. Open to Sophomore - Graduate from across the university - no prior design capacities necessary, though they will help.

51-389 Junior Independent Study
All Semesters
Guidelines for independent study in the Design office. Proposals must be approved by faculty before registration.
51-401 Senior Design Lab
Fall: 12 units
The Fall semester senior year focuses on design agility and helping students develop new ways of addressing the complexity of design problems. Through a series of three independent labs, students explore three kinds of designerly behaviors — wondering, playing, and speaking. These behaviors are not methods to be learned; they are ways of being agile as a designer that frees and empowers you to be both creative and responsive to the situations in which you are working. These labs serve as the requisite precursor to the Spring capstone project. This course is reserved for senior Design majors only.

51-403 Independent Senior Project n
Fall: 12 units
The senior year offers Design majors the opportunity to explore a variety of advanced topics through project-oriented courses. These project courses typically require an integration of skills and knowledge gained throughout the entire design program. Senior projects are often funded by outside companies or organizations, providing real world clients. This project highlights the role that visual interface designers play in the multi-disciplinary attempt to bridge the gap between functionality and usability and to introduce students to some of the unique challenges of designing within the realm of a digital, interactive medium.

51-404 Senior Project I
Spring: 12 units
The senior year offers Design majors the opportunity to explore a variety of advanced topics through project-oriented courses. These project courses typically require an integration of skills and knowledge gained throughout the entire design program. Senior projects are often funded by outside companies or organizations, providing real world clients.

51-405 Senior Project: Communication Design
Fall: 12 units
The senior year offers Design majors the opportunity to explore a variety of advanced topics through project-oriented courses. These project courses typically require an integration of skills and knowledge gained throughout the entire design program. Senior projects are often funded by outside companies or organizations, providing real world clients. This project varies from one semester to the next, providing various opportunities in areas such as exhibit design, branding, and web design.

51-406 Senior Project III
Spring: 12 units
This is the spring offering of 51-405.

51-407 Senior Project: Social Impact by Design
Fall: 12 units
The senior year offers Design majors the opportunity to explore a variety of advanced topics through project-oriented courses. These project courses typically require an integration of skills and knowledge gained throughout the entire design program. Senior projects are often funded by outside companies or organizations, providing real world clients. This project focuses on new product development.

51-408 Senior Project: Environmental Design
Spring: 12 units
This is the spring offering of 51-409.

51-409 Senior Project: Environmental Design
Fall: 12 units
The senior year offers Design majors the opportunity to explore a variety of advanced topics through project-oriented courses. These project courses typically require an integration of skills and knowledge gained throughout the entire design program. Senior projects are often funded by outside companies or organizations, providing real world clients. This project involves the design of a space, both indoors and outdoors, navigation of the space, and use of the space. Projects could include signage, exhibit design, navigation and wayfinding, furnishings within a space, or even park design.

51-414 Senior Project III (IPD)
Spring: 12 units
This course provides an integrated perspective on the many processes by which new products are designed, manufactured, and marketed. Under the direction of faculty from Design, Engineering, and Industrial Administration, students will work together in interdisciplinary groups on the development of real products. In addition to the product development project, the course includes lectures on innovation strategy, opportunity identification, designing products, object representation and manufacturability rules, computer-assisted design and prototyping, concept testing and protocol analysis, redesign issues, market testing, manufacturing and production, and product introduction and management. Open to graduate and senior-level engineering students, industrial administration students, and design students.

51-421 Basic Interaction Design
Fall: 9 units
This course highlights the role that visual interface designers play in the multi-disciplinary attempt to bridge the gap between functionality and usability and to introduce students to some of the unique challenges of designing within the realm of a digital, interactive medium.

51-422 Interaction Design Studio
Spring: 9 units
Intended for HCI double majors, this is the spring offering of 51-421 Introduction to visual interface design. This course highlights the role that visual interface designers play in the multi-disciplinary attempt to bridge the gap between functionality and usability and to introduce students to some of the unique challenges of designing within the realm of a digital, interactive medium.

51-423 Pieces 2.0: Social Innovation: Desis Lab
Intermittent: 9 units
In this class, students will identify a social problem and take a holistic design approach to solving it. They will design a product/product line—anything from a set of tools to help older adults lead a more active lifestyle, to re-envisioned collateral for the Lupus Foundation Pennsylvania. After or in tandem with the creation of this product, the student will construct an image, which will entail print media, a Web presence, packaging, and photography. By creating the product and its “marketing” effort from top-to-bottom, the student will gain a diverse set of skills in design as well as a richer understanding of the product. In the end, all the pieces will come together to create a well-refined image.

51-424 Web Portfolio
Intermittent: 4.5 units
This course will provide an opportunity for students to design and code their own portfolio. The course covers basic elements of Web design along with online portfolio. The course covers basic elements of Web design along with the foundations of HTML, CSS, Javascript and Flash as components of the design process. Prior experience with HTML is encouraged but tutorials will be provided if necessary. This is not an Actionscript programming course.

51-425 Beginning Book Arts Lab
Fall and Spring: 6 units
Beginning Book Arts Lab Class. 6 units. (This class is a prerequisite for the Advanced Book Arts Workshop Lab Class). This is a class of basic issues regarding hand bookbinding and letterpress printing. It’s purpose is to develop a basic structural sense of book forms, of flat format work and of three dimensional forms. Learning hand craft techniques, developing hand skills and the sensitivity to materials are also a goal. Binding projects assigned will target the unique nature of papers, fabrics and archival cardboard. Structural procedures and techniques will be identified with each assigned binding project. The binding projects will be: A hardcover for a paper back book, a single signature book, a multi-signature book with flat spine, and a box construction. The box project is designed and crafted to contain a small letterpress printed class edition, either in book form, or as a set of un-bound pages. The letterpress component teaches the standard issues, unique to the relief process, in press work, handset procedure of cast metal type, page form spacing, lock-up of pages in press, proofing, and production printing. Each semester a small class edition project of text content and image, in two-color registration, is designed, hand set and printed. Image generation can be by hand cut block, assembled type-high forms, or digital process to polymer plate. This class is not to be repeated.
51-426 Beginning Book Arts Lab
Spring: 6 units
Beginning Book Arts Lab Class. 6 units. (This class is a prerequisite for the Advanced Book Arts Workshop Lab Class). This is a class of basic issues regarding hand bookbinding and letterpress printing. It’s purpose is to develop a basic structural sense of book forms, of flat format work and of three dimensional forms. Learning hand craft techniques, developing hand skills and the sensitivity to materials are also a goal. Binding projects assigned will target the unique nature of papers, fabrics and archival cardboards. Structural procedures and techniques will be identified with each assigned binding project. The binding projects will be: A Hardcover for a paper back book, a single signature book, a multi-signature book with flat spine, and a box component. The box projects will contain a small letterpress printed class edition, either in book form, or as a set of un-bound pages. The letterpress component teaches the standard issues, unique to the relief process, in press work, handset procedure of cast metal type, page form spacing, lock-up of pages in press, proofing, and production printing. Each semester a small class edition project of text content and image, in two-color registration, is designed, hand set and printed. Image generation can be by hand cut block, assembled type-high forms, or digital process to polymer plate. This class is not to be repeated.

51-427 Advanced Book Arts Workshop
Intermittent: 9 units
Students will be required to plan and design projects that relate to binding, or digital printing, or letterpress printing, or hand-setting of cast metal type. Projects utilizing a combination of all processes can be planned as well. Experimental projects, or Artists’ Books are also encouraged. In this class structure students will be able to plan and design projects that are complete books, with printed content, or with out content. Other flat structures, and three dimensional containers are examples of general forms that will be categorized as binding work. Emphasis for binding is working independently with a greater level of hand craft and a sensitivity to materials. Emphasis for letterpress printing is to learn in depth, and master, the general mechanical process for doing press work. Emphasis for hand setting is on gaining an understanding of the system of cast metal type, and to develop a sensitivity to typographic principles. Instruction will be given on an individual basis through consultation at strategic times throughout the semester. Project evaluation will be based on the success of the project work compared to each student’s written project proposal at the start of the semester. The Advanced Workshop in Book Arts can be repeated. For more complex project work this class can be continued for the following semester. Prerequisites: 51-426 or 51-425.

51-428 Time, Motion and Communication
Intermittent: 9 units
This course focuses on designing and presenting time-based messages on screen. The differences between paper-based and screen-based communication are discussed and become departure points for projects. Working with word, image, sound, and motion — in Adobe AfterEffects — students develop responses to a variety of project briefs. Some history in animation, experimental films, and tile sequences, as well as experimental music provide conceptual models to our discussions. An attitude of exploration is stressed, with an emphasis on visual voice, performance, and communication. Students will include language, music, image and information. Proficiency with AfterEffects is a requirement. Preference will be given to Design students, both undergraduate and graduate, but seats for non-majors are reserved.

51-431 Revealing Place
Intermittent: 9 units
Revealing Place is a documentary photography class where students will use their cameras to explore a group, idea, and/or location and tell its story. Students will use photography as a way to engage community, document social phenomenon, and define what’s happening at that moment in the history of their chosen setting.

51-433 Advanced Interaction
Intermittent: 9 units
An interface is the link between a user and a product that communicates how a product will be used and creates an experience for the people who will use it. Interaction design is the process of creating and defining product behavior, encompassing both usability and aesthetic dimensions of an artifact, service, or environment. In this course, we will explore issues that pertain to the design of interfaces that activate, excite, hear and touch, with a focus on a variety of design principles, information hierarchy and navigation, multi-modal information presentation, user-product interactions, and how these elements become part of a larger design process. Students will develop a process for creating interactive designs that can be reapplied in future contexts. Prerequisite: 51-421.

51-434 Experimental Form
Intermittent: 9 units
The Experimental Form Studio looks broadly at the discipline of industrial design with an emphasis on creating new paradigms for interactive objects. This course encourages an exploratory study of physical objects and artifacts and provides a creative and intellectual forum to re-imagine our relationship with objects. Each independently-themed project presents opportunities to consider embedded mechanics & technology, objects as interactive media, and experience-driven design. Experimental Form, at its most basic, is a process that blends play and inquiry in an open-ended way – finding the unexpected through tinkering and trying something you don’t quite know how to do, guided by imagination and curiosity. In this course, there are no instructions, no failures, no prescribed right or wrong ways of doing something. In this sense, Experimental Form complements the core ID Studio sequence by providing a playground for intellectual discourse, experimental trial and error, and refining individual processes for designing. This is your sandbox. Prerequisites: Junior standing in industrial design or MDP. Junior level communication design, MTID, MEAs with instructor permission.

51-435 Presentation & Pitch Design
Intermittent: 4.5 units
Presentation & Pitch Design: The premise of the course is to provide design students with the fundamental tools to effectively present and pitch their designs. The foundation of the course is best explained by Dick Buchanan he states, “The designer, instead of simply making an object or thing, is actually creating a persuasive argument that comes to life whenever a user considers or uses a product as a means to some end.” (Buchanan, R. 1985) I am looking to enter into a dialogue with undergraduate and graduate design students based on the notion of creating a “persuasive argument” to their design presentations. More importantly, I am looking to facilitate skill development using narratives as a medium for design students to present and pitch the intent of their designs based on five core principles. Intentional positioning (emphasize with your audience) restraint in preparation (concise structure) simplicity in design (visual congruence with design artifact) clarity in rhetoric (know your message) naturalness in delivery (be yourself) Upon completion of this class, students will have mastery in the Five Core Principles mentioned. They will be able to: Identify and cater to their audience’s needs Empathize with their audience and adjust accordingly Craft a narrative that captures their design intentions Visually compliment their design in their presentation Clearly develop their message (pitch) Develop and present in their own style.

51-439 Design for Service Studio
Intermittent: 9 units
Design for Service Studio is a class of basic issues intended to work in conjunction with Designing for Service Seminar, we will extend the idea of design as more than aesthetics and provide the opportunity for students to practice embodying its perspective and process, mapping design theory to project process. Students will spend the semester in teams, working with the Pittsburgh Post-Gazette to deeply understand their users and stakeholder’s experiences, needs, and aspirations. We will incorporate feedback from news in society, the volatile sector as a whole, and the challenges facing newspapers in America. The human-centered design approach will employ ethnographic research methods, allowing for teams to uncover insights and observations about patterns. Students will in turn learn to synthesize these findings into appropriate models, prototype concepts, and look for opportunities. The design solutions are intended to inform elements of the paper’s competitiveness, creativity, development and future service innovations. The final deliverable will be refined solutions as illustrated in a presentation and process document.

51-441 Foundation of BME Design
Fall: 3 units
This course focuses on the Product Development scope and framing of a new medical device. Students will work together in an interdisciplinary team with Biomedical Engineering students to identify medical professional or patient needs through behavioral research and participatory research methods. This course deliverable requires the team to propose the problem space and develop a design brief and plan for the following Spring semester to implement. Prerequisite: Junior level design or higher with studio training. Solid modeling or surface modeling recommended.
51-451 Fundamentals of Joinery & Furniture Design
Fall: 9 units
Intensive introduction to traditional joinery techniques and the properties of wood through the use of textbook studies and lab experiments. Emphasis placed on how these techniques and properties influence design decisions. Students will learn how to set up, sharpen and use traditional hand powered tools. This acquired knowledge will be applied in the design and realization of a piece of wooden furniture. Limited enrollment. Lab fee and material purchases required. Prerequisite: 51-243.

51-452 Furniture Design II
Spring: 9 units
A continuation of 51-451, this course explores a much broader range of issues related to furniture design. Students will identify and define in a proposal the area of furniture design they intend to investigate and then produce one or more furniture pieces developed from their findings. Materials and processes applied to the project are limited only by the resources the student can bring to bear. Assigned readings and a series of in-class discussions will focus on the influence of workmanship in design, and on how the behavior of the user is influenced by the form or esthetic language of the artifact. Lab fee & material purchases required. Prerequisite: 51-451.

51-453 Applied User Research
4.5 units
This course is an opportunity for students to study how user research applies to concrete design projects in a more conceptual case study. Students will study three different design projects that pursue a human-centered design approach: The Domestic Mail Manual (DMM) Transformation Project by the United States Postal Service, the Australian Taxation Project by the Australian Tax Office, and the Income Tax Form Redesign by the Internal Revenue Service of the United States. Students will trace the role of user research in each case. The class will take the format of a seminar with lectures, presentations and readings. Together with actual samples from the three case studies, they will provide a background for rich discussions. Students will walk away with three key insights into applied user research: They will understand how user research applies to a complex system, such as an organization. Simultaneously, students will gain an understanding of the opportunities and the potential pitfalls that arise when co-designing with a client. Finally, by studying the design process and the artifacts that were developed by these three projects, the contribution of user research in designing interactions of individuals with organizations, the effect of user research on an organization and the potential of user research organizational change will become evident. Open to graduate and advanced undergraduate students in design. Because of the nature of the projects and the organizations involved, this course may also be of interest to students with a background in organizational behavior, management and public policy.

51-455 Design the Future: HUMAN Centered Innovation for Exponential Times
Intermittent: 9 units
DESIGN THE FUTURE: Human Centered Innovation for Exponential Times As corporations, governmental organizations, and civil associations face accelerating change in uncertain times, increasingly they are looking to designers to shape futures defined by socio-technical problems throughout private, public, civil and philanthropic sectors worldwide. For designers trained to shape futures defined by uncertainty and change, these exponential times represent unprecedented creative opportunities for innovation. In this course, students explore methods and tools for design in exponential times to shape uncertain futures. Students will explore the forces that drive change in the future (i.e., social, economic, political, environmental, technological), and learn to align innovation strategically with the trajectories of those forces. The design project that drives everything else is the future of mega-metropolitan regions, the hubs of innovation where 70% of people in the world and 75% of Americans will live in 2050. In the semester long project, students create scenarios for Life 2050 in Metro 3.0, using Pittsburgh as a locus and focusing on a project within urban systems such as Sustainable Production & Consumption, Lifelong Learning, Human Development and Resilient Community.

51-471 Practicing Design
Fall: 9 units
This is a lecture course covering all aspects of design practice. Students learn to formulate a plan for professional practice, market creative services, manage projects, and understand the legal and ethical issues associated with design practice. This course will also address the changing role of the design professions. Visiting professionals, case studies, and supplementary readings provide resources for class discussion. This course is required for all senior design majors.

51-472 Globalization and Design
Intermittent: 4.5 units
Designers are often required to plan products for markets around the world. Diversity of cultural value plays a central role in user experience and product development in the global context. This mini course is a seminar that explores the topic of culture. The first part of the course will provide students with terminology, perspectives, concepts, and knowledge based on discussions of selected readings from the classic and contemporary literature as well as diverse examples from the field. The second part of the course will examine how these theories relate to design research and practice. Individual and group assignments will help students relate the concepts to the practice of design.

51-478 Design Fictions & Imaginary Futures
Intermittent: 9 units
This praxis-based course will actively engage futures research through the integration of findings from critical readings, ethnographic research, mediated storytelling and hybrid prototyping. Using techniques of inversion, defamiliarization, uncertainty scenarios, everyday practice and good old-fashioned humor, we will create objects, systems and experiences that stimulate conversation, debate and understanding. The course seeks to produce a diversity of ‘what will?’ and ‘what if?’ cultural provocations that deeply examine possible, unwanted and seductive futures. This course is open to Junior and Senior Design majors, or by permission of the instructor.

51-479 Design Methods: Analysis and Creativity
Intermittent: 9 units
Design Methods: Analysis and Creativity Most designers recognize that “process” is an important part of professional practice, yet the “methods” that try to capture design process are varied and often conflicting. The goal of this course is to explore design methods and their supporting techniques, seeking a better understanding of the pattern of inquiry upon which they are based. The course will include a close reading of works in the “design methods movement” of the 1960s and 1970s. This movement rightly occupies a central place in the development of design methods and methodology in the twentieth century. It is at times insightful, at other times confusing and dissatisfying. Nonetheless, it is essential to understand what was attempted and actually accomplished by individuals such as Bruce Archer, John Chris Jones, Horst Rittel, and Christopher Alexander. Our current understanding of design methods, including the new forms of user research, is grounded on their work.

51-481 Visualizing Stories
Intermittent: 4.5 units
Students This course is open to HCI and Design graduate students and senior-level Design students. Students need a basic knowledge of communication and interaction design. Experience with interactive prototyping, digital video editing, and graphic layout are encouraged but not required. Course Description When viewers watch a TV news story, they never see the whole story. Instead they see, a short synopsis of the back-story, a quick update of the latest findings, and speculations on the future outcome. Will he be found guilty? Will she be re-elected? Will the hurricane damage more property than last time? What viewers never get from TV news is a complete view of how a story evolves over time from beginning to end. In this project course students will work in small teams to develop visualizations of both individual current news stories as well as the evolution of these stories over time. Working with a small set of CNN video clips, students will produce both static and interactive visualizations that offer insights into the story that a traditional linear video broadcast can never provide. In much the same way Minard’s map on Napoleon’s march to Moscow captures an entire story in a single image, students will work to reveal the relevant features that best communicate both what is happening in the individual news story as well as the larger story evolving over many weeks.

51-483 Debating the Roles & Responsibilities of the Designer
Intermittent: 9 units
Designers are expected to play a role in creating aspirational lifestyles through products and services, and informing and influencing human behavior on small and large scales. However what impact does or should the designer have on our lives, our society, and culture? Through readings, discussions, and team discussions, students will consider arguments and debate the role and responsibility of the designer in a critical and fun way.
51-488 Design, Management and Organizational Change
Intermittent: 9 units
Design, Management, and Organizational Behavior 51-488/51-788 The goal of this course is to help Design students better understand how organizations affect the practice of design and, in turn, how the practice of design and affect organizational life. Topics covered will include the history and theory of management, some of the current practices of management that have direct bearing on design (such as strategic planning), and some of the central concepts of organizational theory that will help students learn to interpret and work within organizations. Pre-requisites: this course is intended primarily for design graduate students, with a few seats reserved for undergraduate Design majors. Non-Design majors must obtain the instructor's permission to register for this course.

51-499 Senior Independent Study
All Semesters
Guidelines for independent study in the Design Office. Proposals must be approved by faculty before pre-registration.

51-880 Experiential Media Design
Intermittent: 12 units
To be determined.