HUMAN-COMPUTER INTERACTION (HCI)

HCI 201 | MULTIMEDIA AND THE WORLD WIDE WEB | 4 quarter hours
(Undergraduate)
An introduction to the World Wide Web and web development for non-technical majors. Students will create web pages using a WYSIWYG editor. Students will evaluate web sites using a variety of analytical and empirical methods. Students will conduct technology-related experiments following the principles of the scientific method and use technology to analyze their results. Topics include web-based technology, creating content for distribution on the web, and design principles for web sites. Students will develop an appreciation for the connections among science, mathematics, and technology in modern society, as well as for the principles guiding advances in science and technology.

HCI 302 | FOUNDATIONS OF DIGITAL DESIGN | 4 quarter hours
(Undergraduate)
Shape, line on two-dimensional surfaces. Color. Composition rules as they apply to digitally created documents. Digital manipulation of two-dimensional images. Use of commercially available draw and paint tools to create two-dimensional designs.
Graduate standing is a prerequisite for this class.

HCI 402 | FOUNDATIONS OF DIGITAL DESIGN | 4 quarter hours
(Graduate)
Shape, line on two-dimensional surfaces. Color. Composition rules as they apply to digitally created documents. Digital manipulation of two-dimensional images. Use of commercially available draw and paint tools to create two-dimensional designs.

HCI 406 | WEB SITE DESIGN FOR HCI | 4 quarter hours
(Graduate)
Web design introduced in a user-centered context. Application of visual design principles and common design patterns for web sites and mobile interfaces. Page markup using HTML and CSS addressing responsive web design, accessibility, and search engine optimization.

HCI 412 | HCI DESIGN FUNDAMENTALS I | 4 quarter hours
(Graduate)
Focus on visual design basics. Evaluate, critique and create two-dimensional artifacts (using digital and non-digital tools). Introduction to design elements that include gestalts, color, line, value, shape, patterns and perspective.

HCI 421 | DESIGNING FOR CONTENT MANAGEMENT SYSTEMS | 4 quarter hours
(Graduate)
Design and development of Web sites using common database-driven content management systems (CMSs) and publishing tools such as those used to manage blogs, community portals, and other content-heavy websites. Discussions of how familiarity with CMS tools assists the role of the user experience designer. Visual design and theme customization using prior knowledge of CSS. Taxonomy systems, installation of add-on modules, and user management using today's widely used systems.
HCI 406 is a prerequisite for this class

HCI 422 | MULTIMEDIA | 4 quarter hours
(Graduate)
Multimedia interface design. Underlying technological issues including synchronization and coordination of multiple media, file formats for images, animations, sound and text. Hypertext. Information organization. Survey of multimedia authoring software. Topics in long distance multimedia (World Wide Web). Students will critique existing applications and create several multimedia applications.
HCI 440 or consent of the instructor

HCI 430 | PROTOTYPING AND IMPLEMENTATION | 4 quarter hours
(Graduate)
Overview of prototyping methods ranging from low-fidelity to interactive script-based prototypes. Analysis of prototyping tools and their relative advantages. Projects include prototype development over multiple iterations using a variety of strategies.
HCI 440 is a prerequisite for this class.

HCI 440 | INTRODUCTION TO USER-CENTERED DESIGN | 4 quarter hours
(Graduate)
The user-interface development process. Introduction to methods for practicing user-centered design including user and task analysis, user interface design principles and testing using low-fidelity prototypes. Students may not receive credit for this course and HCI 441.

HCI 441 | INTRODUCTION TO USER-CENTERED DEVELOPMENT | 4 quarter hours
(Graduate)
Overview of the user-centered design (UCD) process with an additional emphasis on user interface development. Coverage of UCD process includes effective, low-cost methods for user research, interaction design and evaluation. User interface development involves application of front-end development languages (HTML and JavaScript) and frameworks (jQery). This course is offered to students with programming experience as an alternative to IT 411 and HCI 440. Students may not receive credit for this course and HCI 440.
CSC 403 is a prerequisite for this class.

HCI 445 | USER RESEARCH METHODS | 4 quarter hours
(Graduate)
This course provides students with skills necessary to conduct, analyze and communicate user research. Topics include: (a) common methods for collecting user data; (b) analysis techniques to examine user research data; and (c) ways to document and communicate user research findings.
HCI 440 is a prerequisite for this class.

HCI 450 | FOUNDATIONS OF HUMAN-COMPUTER INTERACTION | 4 quarter hours
(Graduate)
Application of engineering and psychological theory to the design of computer systems. Overview of applicable research methods and research on perception, cognition, errors, and screen design. Attention will be given to creating and applying guidelines derived from research.
IT 403 is a prerequisite for this class.

HCI 454 | INTERACTION DESIGN AND INFORMATION ARCHITECTURE | 4 quarter hours
(Graduate)
Information architecture and interactive page design. Perception and use of menus, labels and user controls. Structuring information for navigation and presentation. Selecting and placing user controls for optimizing task flow on pages and across pages. Creating wire frames and using content managers.
HCI 440 is a prerequisite for this class.

HCI 457 | INFORMATION ARCHITECTURE AND CONTENT STRATEGY | 4 quarter hours
(Graduate)
Organization and design of applications and web sites for effective information navigation. Survey and practice of methods for content strategy (CS) and information architecture (IA), including content inventories and card sorting. Processes include mapping content to structure and creating controlled vocabularies for specific audiences. Students apply CS and IA methods in the design of diverse applications.

HCI 460 | USABILITY EVALUATION METHODS | 4 quarter hours
(Graduate)
Survey of evaluation methods that can be applied to user interfaces. Methods include expert inspections, walkthroughs, usability testing and analytical approaches. Students evaluate existing systems by applying some of these methods.
HCI 440 is a prerequisite for this class.

HCI 470 | DIGITAL DESIGN | 4 quarter hours
(Graduate)
Focus on the visual aspects of interfaces for information and communication technologies (ICTs). Evaluate, critique and create ICT interfaces using design principles. Learn to choose color, type, layout and imagery to create aesthetic and usable ICT interfaces. Introduction to information visualization. Applying course concepts, students create and develop their own web-based portfolio.
HCI 402 and HCI 406 are prerequisites for this class.

HCI 472 | HCI DESIGN FUNDAMENTALS II | 4 quarter hours
(Graduate)
Focus on the visual design in digital artifacts. Evaluate, critique and create digital artifacts organized by design principles. Choose color, type, layout and imagery towards the creation of aesthetic and usable, responsive and accessible digital artifacts. Introduction to accessibility, information visualization and animation.
HCI 412 AND HCI 406 are prerequisites for this course.

HCI 511 | ACCESSIBILITY CONSIDERATIONS IN HCI | 4 quarter hours
(Graduate)
Methods and principles for designing interactive technologies for diverse users, including children, elderly, and people with disabilities and alternative skills. Analysis of how current technologies address diverse user needs and considerations about how technologies might be improved to better meet diverse user needs. Class projects include a web accessibility evaluation based on current w3 standards and an in-depth research project in which students ideate a new technology or evaluate an existing technology in which they work directly with people who have disabilities.
HCI 445 is a prerequisite for this class. HCI 460 is recommended.

HCI 512 | INFORMATION VISUALIZATION AND INFOGRAPHICS | 4 quarter hours
(Graduate)
Communicating information through visualizations. Students learn how to choose effective means to visualize data for (a) their intended audience(s) and (b) for the message they intend to communicate. Students practice creating and evaluating visualizations using a variety of tools and methods.
IT 403 and (HCI 470 or HCI 472) are prerequisites for this class.

HCI 513 | DESIGN/STRATEGIES FOR INTERNET COMMERCE | 4 quarter hours
(Graduate)
(Cross-listed with ECT 555) An integrated study of design, technical, and strategic issues for Internet commerce. Web analysis, design and publishing. Visual, textual and content organization, response time, usability testing. Authorizing tools and administering web server. Internet database servicing. Internet service providers and pricing. Digital cash and encryption. Impact on the value chain, intermediation, and market structure. Strategies for mass customization, interactive marketing, and support for collaborative work.
IS 422 or HCI 430 is a prerequisite for this class

HCI 514 | GLOBAL USER RESEARCH | 4 quarter hours
(Graduate)
Theories and approaches for conducting HCI research and creating digital media for international audiences. Varied topics include (a) cultural models and global differences that influence design of digital artifacts (b) approaches to conducting usability and other types of user research and (c) information communication and technologies for development (ICT4D).
HCI 445 and HCI 460 are prerequisites for this class.

HCI 515 | DESIGN ETHNOGRAPHY | 4 quarter hours
(Graduate)
This discussion course focuses on topics related to ethnographic methods such as activity theory, value sensitive design, online ethnography and reflexivity. Students will conduct participatory observations, interviews, and diary studies (all methods designed to engage with users "in the wild") and translate the results from those studies into design implications. In this service learning course, students will work with community partners to conduct ethnographic studies and design a tool for the organization based on the results from the formative study.
HCI 454 or HCI 457 are prerequisites for this class.

HCI 516 | BEHAVIORAL SCIENCE & UX | 4 quarter hours
(Graduate)
Behavioral Science & UX will examine addressing complex behavior change through a deeper understanding of behavioral science. This course begins with the foundational elements of behavioral science including context, mental models, emotions and social dynamics and will progress into implementation methods. By having a foundational understanding of how we as humans make decisions, we are able to design more impactful solutions and persuasive technologies.
HCI 445 and HCI 450 are prerequisites for this class.

HCI 520 | LEARNER-CENTERED DESIGN | 4 quarter hours
(Graduate)
Design and evaluation of technology-based learning systems. Theories and models of human perception and cognition as they apply to learning, instruction and training. Application of established principles for analyzing and designing learning systems. Projects include evaluating existing learning systems and the creation of a learning system.
HCI 440 is a prerequisite for this class.

HCI 521 | UX OF CHATBOTS & GENERATIVE AI | 4 quarter hours
(Graduate)
Chatbots and Generative AIs are emerging and potentially transformative technologies that will affect multiple professions, including the practice of user experience (UX). Good UX design is important for the adoption of new technologies. In this course, students will learn about and ideate tools aimed at creating good UX for chatbots and Generative AI systems and explore the capabilities and limitations of these technologies and their possible effects on the professional lives of UX practitioners.
HCI 445 and HCI 460 are prerequisites for this course.

HCI 522 | UX STRATEGY AND WEB ANALYTICS | 4 quarter hours
(Graduate)
In this course, students examine how to align user experience (UX) approaches with business strategy. Topics include: (a) examining how business and UX strategies are aligned; (b) translation of business goals into measurable metrics; and (c) assessing metrics using services such as Google Analytics.
HCI 460 is the prerequisite for this class

HCI 530 | MOBILE DESIGN | 4 quarter hours
(Graduate)
Theoretical and practical issues for designing mobile devices. Design strategy, patterns and research within a mobile context. Students will learn to create useful, usable and enjoyable experiences that consider the unique capabilities and constraints of mobile platforms. Project deliverables includes wireframes for diverse platforms such as responsive mobile web, iOS, and Android native apps.
HCI 454 or HCI 457 are prerequisites for this class.

HCI 541 | SURVEY DESIGN AND ANALYSIS | 4 quarter hours
(Graduate)
Design and analysis of surveys with an emphasis on user experience research. Benefits and costs of using surveys compared to other UX methods; factors for when survey use is appropriate. Sampling and threats to validity. Survey question design, pilot testing, implementation, and analysis. Application of statistical methods for analysis of survey data. Use of survey software such as Qualtrics.
HCI 445 or DSC 441 are prerequisites for this class.

HCI 545 | EMBODIED INTERACTION | 4 quarter hours
(Graduate)
This course covers the history, theory and philosophy behind embodied interaction (including cognitive, physiological, and social aspects), and discusses some of the best current examples of embodied interaction in digital interfaces. The course leverages students knowledge of User-Centered Interaction Design (UCID) from HCI 440 and their exposure to the psychological and physiological theories and experimental findings from HCI 450 and extends these into embodied interaction in three dimensions. It does this by exposing students to post-WIMP (windows, icons, menus, pointer) and blended/ubiquitous computing interfaces. Coursework includes a series of individual assignments that results in an embodied interaction prototype suitable for evaluation by real users; critical review and discussion of current research and development in embodied interaction; and critical review of other students' work. The sequence of assignments require students to identify an opportunity or need for application of embodied interaction; perform user research; create appropriate models as precursors to design; perform conceptual design; and design and create an embodied interaction prototype in a medium of their choice. They must then evaluate their prototype in tests with real users. Students are expected to share their application proposal, elements of other assignments, and reading summaries with the rest of the class.
HCI 440 and HCI 450 are prerequisites for this class.

HCI 553 | SOCIAL INTERACTION DESIGN | 4 quarter hours
(Graduate)
UX principles and strategies for designing social apps and web sites. Analysis and use of interaction patterns for organizing, sharing, and discussing content. Application of theories relating to social networks, privacy and social capital. Students apply user-centered processes to the design of a social app.
HCI 454 or HCI 457 are prerequisites for this class.

HCI 558 | INTERACTION DESIGN AND ANALYSIS | 4 quarter hours
(Graduate)
Design and analysis of interactive technologies with emphasis on complex interactions and repeated use. Analysis and selection of appropriate interaction styles including command entry, form completion, menu selection, direct manipulation, code-based automation, and intelligent speech-based interaction. Specifying interaction using flowcharts, wireframes and prototypes. Taxonomy of errors and common approaches for avoiding them. Practices for minimizing effects of multi-tasking and cognitive load. Analysis methods, such as application of the GOMS keystroke-level model, for informing design. Student projects include the design and analysis of interactive user interfaces for diverse contexts and uses.

HCI 580 | USER EXPERIENCE DESIGN PRACTICUM | 4 quarter hours
(Graduate)
Working with clients, students choose and practice appropriate methods learned in the HCI foundational courses to address business goals and user needs. Course coverage includes best practices for consulting, effective communication with clients and coworkers, understanding business and organizational needs, and setting realistic goals and expectations.
HCI 454 or HCI 457 are prerequisites for this class.

HCI 590 | TOPICS IN HUMAN-COMPUTER INTERACTION | 4 quarter hours
(Graduate)
Specific topics selected by the instructor. Topic varies with each offering. Contact instructor for more information. Prerequisite(s): See syllabus or consent of the instructor.

HCI 594 | HUMAN-COMPUTER INTERACTION CAPSTONE | 4 quarter hours
(Graduate)
HCI 594 provides an opportunity for students to apply all of the skills they have learned on one comprehensive project. Multidisciplinary teams design, evaluate, and implement a user interface intensive project. Students prepare written documents describing their activities and present the final results to the class. PREREQUISITE(S): Completion of the HCI core courses or consent of the instructor.
HCI 445 and HCI 430 and HCI 450 and HCI 460 and (HCI 454 or HCI 457) are prerequisites for this class.

HCI 596 | HCI RESEARCH CAPSTONE | 4 quarter hours
(Graduate)
This course provides students with the experience of reading and synthesizing the literature on a particular HCI topic, with particular attention to judging the quality of the sources. The course also teaches the student to develop an annotated bibliography on a particular topic, and develop a research plan for writing a research survey paper or develop a research plan to answer a specific question by designing an experiment/questionnaire. After presenting their paper, the student will review other student's papers, and provide appropriate criticism. All students will be required to sign up for the CDM/COMM participant pool. We will invite researchers at CDM to discuss their current research.
HCI 450 or HCI 460 is a prerequisite for this class.

HCI 599 | INDEPENDENT STUDY | 1-4 quarter hours
(Graduate)
Independent study supervised by an instructor. Independent study form required. Can be repeated for credit. Prerequisite(s): Consent of the instructor.

HCI 690 | RESEARCH SEMINAR | 1-4 quarter hours
(Graduate)
PREREQUISITE(S): Instructor consent required. (variable credit)