Human Computer Interaction (HCI)

Courses primarily for graduate students, open to qualified undergraduates:

HCI 504. Evaluating Digital Learning Environments. (Cross-listed with C I). (3-0) Cr. 3. S. Prereq: C I 501
Principles and procedures to plan, design, and conduct effective evaluation studies (formative, summative, usability) in different settings are studied. Opportunities to engage in real or simulated evaluation projects of substantial scope are provided. Create evaluation instruments, develop methods with which to evaluate a product or program, conduct try-outs or usability sessions, analyze the data, report the findings, and recommendations are some of the course activities.

HCI 507. Principles of 3D Character Animation. (Dual-listed with HCI 407). (0-6) Cr. 3. Repeatable, maximum of 9 credits. Prereq: ARTIS 308
Animation techniques using the computer and available software. Principles of character animation. Prior knowledge of modeling, lighting, texturing and rendering with available software is assumed. Nonmajor graduate credit.

HCI 509. Computer/Video Game Design and Development. (Dual-listed with HCI 409). (0-6) Cr. 3. Repeatable, maximum of 12 credits. Prereq: Permission of instructor. Programming emphasis: COM S 227, COM S 228, COM S 229 or equivalent in engineering; art or graphics emphasis: ARTIS 230 and ARTIS 308; writing emphasis: an English course in creative writing or writing screen plays; business or marketing students: Junior classification
Independent project based creation and development of "frivolous and non-trivial" computer games in a cross-disciplinary team. Projects require cross-disciplinary teams. Aspects of Indie development and computer/video game history will be discussed. Nonmajor graduate credit.

HCI 515. Statistical Natural Language Processing. (Cross-listed with ENGL, LING). (3-0) Cr. 3. F. Prereq: STAT 330 or equivalent, recommended ENGL 219 or LING 219, or ENGL 511 or LING 511
Introduction to computational techniques involving human language and speech in applications such as information retrieval and extraction, automatic text categorization, word prediction, intelligent Web searching, spelling and grammar checking, speech recognition and synthesis, statistical machine translation, n-grams, POS-tagging, word-sense disambiguation, on-line lexicons and thesauri, markup languages, corpus analysis, and Python programming language.

HCI 520. Computational Analysis of English. (Cross-listed with LING, ENGL). (3-0) Cr. 3. S. Prereq: ENGL 510 or LING 510, and ENGL 511 or LING 511
Concepts and practices for analysis of English by computer with emphasis on the applications of computational analysis to problems in applied linguistics such as corpus analysis and recognition of learner language in computer-assisted learning and language assessment.

HCI 521. Cognitive Psychology of Human Computer Interaction. (Cross-listed with PSYCH). (3-0) Cr. 3. S. Prereq: Graduate classification or instructor approval
Biological, behavioral, perceptual, cognitive and social issues relevant to human computer interactions.

HCI 522. Scientific Methods in Human Computer Interaction. (3-0) Cr. 3. Alt. S., offered 2013. Prereq: PSYCH 521 and STAT 101 or equivalent
Basics of hypothesis testing, experimental design, analysis and interpretation of data, and the ethical principles of human research as they apply to research in human computer interaction.

HCI 525. Optimization Methods for Complex Designs. (Dual-listed with HCI 425). (Cross-listed with M E). (3-0) Cr. 3. S. Prereq: ENGR 160, MATH 265
Optimization involves finding the 'best' according to specified criteria. Review of a range of optimization methods from traditional nonlinear to modern evolutionary methods such as Genetic algorithms. Examination of how these methods can be used to solve a wide variety of design problems across disciplines, including mechanical systems design, biomedical device design, biomedical imaging, and interaction with digital medical data. Students will gain knowledge of numerical optimization algorithms and sufficient understanding of the strengths and weaknesses of these algorithms to apply them appropriately in engineering design. Experience includes code writing and off-the-shelf routines. Students will also be exposed to numerous case-studies of real-world situations in which problems were modeled and solved using advanced optimization techniques.
HCI 595. Visual Design of HCI.  
Cr. 3. SS.  
Human interaction design as it applies to HCI. Aspects of audience analysis, design methodologies for creating concepts and solutions, techniques of concept prototyping, and the fundamentals of visual design such as color, type, symbolism, and grid structure. Class discussions, tutorials, and hands-on projects.

Cr. 3. SS. Prereq: HCI 521  
Usability evaluation with emphasis on requirements gathering, rapid prototyping, evaluation, and communicating results through report writing along with emerging practices.

HCI 597. Scientific Information Design.  
Cr. 2. SS.  
Use of principles of visual design such as color, typography, photography, graphs, charts, and layout to create effective poster and power point presentations. Experience with design software, create posters and presentations from their own data, and evaluate design solutions with regard to their visual and verbal communication. Principles of design and communication theory will be introduced.

HCI 598. HCI Design, Implementation and Implications.  
Cr. 3. S. Prereq: 21 credits in human computer interaction or permission of the instructor  
Capstone course in HCI. Through a significant team-based design project and open-book final exam, students demonstrate their mastery of core courses in HCI.

HCI 599. Creative Component.  
(3-0) Cr. 3.  
Creative component for nonthesis option of Master of Science degree. Offered on a satisfactory-fail basis only.

Courses for graduate students:

HCI 603. Advanced Learning Environments Design.  
(Cross-listed with C I). (3-0) Cr. 3. S. Prereq: C I 503  
Exploration of advanced aspects of the instructional design process. Application of analysis, design, development and production, evaluation, implementation, and project management principles. Focus on the production and use of instructional technology with an emphasis on the instructional design consulting process. Theory and research in instructional technology provides the foundation for design decisions.

HCI 655. Organizational and Social Implications of Human Computer Interaction.  
(Cross-listed with MIS). (3-0) Cr. 3. Prereq: Graduate classification  
Examine opportunities and implications of information technologies and human computer interaction on social and organizational systems. Explore ethical and social issues appurtenant to human computer interaction, both from a proscriptive and prescriptive perspective. Develop informed perspective on human computer interaction. Implications on research and development programs.

(Cross-listed with I E). (3-0) Cr. 3. S. Prereq: IE 577 or PSYCH 516 or HCI/PSYCH 521 or equivalent or instructor's permission  
Theoretical and methodological applications of cognitive engineering - literature evaluation, experimental analysis, study and application of bio and neurological information (electromyography (EMG) and electroencephalogram (EEG), data interpretation, statistical analysis and experimental design.

HCI 697. HCI Internship.  
Cr. R. Repeatable. Prereq: Permission of Director of Graduate Education, graduate classification

HCI 699. Research.  
Cr. arr. Repeatable.