PACE UNIVERSITY

Seidenberg School of Computer Science and Information Systems

Master of Science in Human Centered Design

Program Curriculum

Course Name		Credits
Required Foundation Courses (18 credits)		
IS 638	Introduction to User Experience Design	3
CS 659	Introduction to Human Computer Interaction	3
IS 628	Research Methods and User Experience	3
CS 663	Human Factors and Usability Matrix	3
IS 630	Prototyping and User Experience	3
IS 691 OR CS 665	UX Capstone Project OR Product Development Project	3
Electives (12 credits)		
Development Concentration		
CS 641	Mobile Web Content and Development	3
CS 639	Mobile Application Development	3
CS 643	Mobile Innovations for Global Challenges	3
IS 629	Programming User Interfaces	3
IS 612	Introduction to Coding	3
IS 623	Information Systems Design and Development	3
Design and Evaluation Concentration		
IS 690E	Information Architecture	3
IS 627	Visual Design for Technology	3
IS 665	Introduction to Data Mining and Visualization	3
IS 617	Information Systems Principles	3
IS 676	Foundations of Social and Mobile Technologies	3
IS 686	Social and Collaborative Computing	3
IS 679	Cognitive Science and Technology	3
Program Total		**30 Credits**

Course Descriptions

Foundation Courses

IS 638 Introduction to User Experience Design

This course introduces students to User Experience, the practice of designing apps and websites while applying user centric methods. This course touches on the entire process from analyzing user needs, iterating the design, presenting and selling a comprehensive solution to creating wireframes that become the blueprint for developers to follow when coding.

CS 659 Intro to Human Computer Interaction (cf SE 760)

Design principles and practical techniques will be introduced for building and evaluating user-centered, intuitive, effective computing systems; these will be explored through a series of design projects and student presentations. Topics include principles of usable design, interface elements, user psychology, prototyping, and an introduction to interface evaluation. Project examples may include web design, multimedia interfaces, mobile and specialized applications.

IS 628 Research Methods for User Experience

In User Experience, the foundation is research and is a required skill. Without understanding the user's behavior, patterns and pain points, authentic User Experiences cannot be created. Students can expect a comprehensive guide to performing the core research methods; Surveys, Interviews and Usability testing. This course will help prepare students for a future career in User Experience by giving the student a basic knowledge of the "Discovery" phase of any research that is associated with any user, application or product.

CS 663: Human Factors and Usability Metrics

This course surveys methods for evaluating user interfaces. Students will learn essential knowledge to be able to perform a heuristic evaluation, a cognitive walkthrough, a usability test and a comparison study. Class meetings will also introduce, discuss and occasionally practice additional techniques including user modeling, usage logging, surveys, and focus groups. A primary goal is to learn how to conduct various methods for evaluating user interfaces.

IS 630: Prototyping and User Experience

This course explores the role of prototyping in the development lifecycle of software systems. It enables students to develop and communicate interactive design prototypes. It introduces a variety of prototyping methodologies such as paper, wireframing, and wizard-of-oz. Students will learn which techniques are the most appropriate to use in the various stages of development and when communicating with the varied audiences involved in the development process.

IS 691: User Experience Capstone

The goal of the capstone course is to provide an opportunity for students to work on a design challenge, which allows them to apply the concepts and techniques acquired in the previous courses to create an original product or service for a client. The projects can come from an external client, such as a faculty, industry expert or a company, or as an extension of a previous project conducted by the student. Students work in self-directed teams to plan, analyze and

design a solution to the problem being explored in the project. The process includes problem discovery, contextual research, information organization, concept development, prototyping, and usability testing. The students present the concept to the client.

CS 665 Product Development Project

Students will learn the process of developing a product using the Design Thinking methodology and the skills they have gained in the course of their studies. They will work in interdisciplinary teams and provide solutions to problems identified by companies or sponsors. During the course, students will also learn the following topics: design thinking, product development, research methodologies, agile methodologies user experience, project management, prototyping and rapid iteration. This course evolves under the umbrella of the Pace NYC Design Factory.

Elective Courses

Development Concentration

CS 639: Mobile Application Development

This course surveys the specificities of the development of native applications for different mobile platforms including phones and tablets. The software engineering of application development including user-centered design, testing and quality assurance will be emphasized. Students will learn how to design and develop applications for the Android platform. The following topics will be covered user interface, events processing, services management, location based facilities, accelerometer and other sensors, networks/web access, and sound and multimedia. The parallel with iPhone development will be presented. The distribution of mobile applications and business models for monetization will be covered. A significant project is integrated in the course.

CS 641: Mobile Web Content and Development

This course introduces students to the techniques used to create web sites for basic and smart phones. Particular attention will be on gathering data about web traffic (e.g. visitors, visits, devices, operators, and locations) and analyze the data to engage the users and for business decision making. Content including social networking and privacy will be discussed in depth. The course also covers the development of mobile web applications using HTML5, CSS and AJAX for Android phones. The parallel with iPhone will be made. User-centered design, testing, quality assurance and performance will be covered throughout the course. The course integrates comprehensive assignments and significant readings.

CS 643: Mobile Innovations for Global Challenges

This course familiarizes students with the development of mobile innovations addressing social and global challenges in areas such as health, microfinance, education and civic activism. Students will be introduced to research in the social considerations in mobile application

development, ICT4D (Information and Technology for Development), and M4D (Mobile for Development) through readings, class discussions and a series of talks. The Mobile Web, and SMS and Voice Solutions will be presented in that context. Students will leverage their technical knowledge with social insight, creativity and ingenuity to develop prototype with social impact along with its deployment plan (taking into accounts the real world limitations) and a business model, with the guidance of local partners from NGOs and the industry, and successful social entrepreneurs.

IS 629: Programming User Interfaces

This course provides students with the ability to to implement a user interface including the development of a design kit and a component kit. Students will learn how to write a web components style-guide using preprocessor CSS frameworks and integrate it with applications using JavaScript frameworks. Students will also learn how to implement responsive design and design for accessibility, by applying current trends in user interface design and development.

IS 612: Introduction to Coding

This course covers methods for developing solutions to business and system problems using object-oriented techniques. The course covers the three fundamental elements of object-oriented programming: inheritance, encapsulation, and polymorphism. Students will learn how to use classes and objects, abstract data types, and interfaces to develop object oriented solutions. Students will also use Java library classes and methods to manage I/O streams, handle events, and create graphical user interfaces. Students will be introduced to the use of data structures in programs and the use of UML (Unified Modeling Language).

IS 623: Information Systems Design and Development

This course provides an introduction to Systems Analysis and Design. Topics include analyzing the business case, requirements modeling, data and process modeling, and development strategies, with a focus on project management. Students also learn about output and user interface design, data storage design, systems architecture, implementation, and systems operation, support, and security.

Design and Evaluation Concentration

IS 690E: Information Architecture

In the digital age, information is an ever-growing factor, understanding how to organize it based on user mental models and behavior is more imperative than ever. This course will help prepare students for a future career by giving the student a basic knowledge of Information Architecture. The course explores: The definition of Information Architecture; Information needs and seeking behavior; Organizational models and structure of information; Navigation defined, as well as its anatomy; Research (Card Sorting) and When and how to use search.

Students will explore basic concerns and methods to design an appropriate information structure/navigation while taking into consideration the needs of the user.

IS 627: Visual Design for Technology

This course is designed to give students an understanding the principles and theory of graphic design as it applies to technology. When completed, students will be able to brand and flavor websites and applications. Students will explore the meaning of graphic design, how to identify its application, develop their own creative process, how to be a practitioner of design including having the appropriate vocabulary, to articulate ideas and concepts in a critique setting, analyze/critique graphic design using sound principles and iterate upon original work to bring it professional standards.

IS 665: Introduction to Data Mining and Visualization

This course provides a foundation for learning the basic concepts of data mining and visualization. The course focuses on distinctly "real -world" orientation that emphasizes application of data analysis over algorithm design and development in most topic areas. The course pre-requisites are understanding database concepts and familiarity with information or business decision systems.

IS 617: Information Systems Principles

This course examines managerial information requirements for operation, control, organization and planning, and the ways in which information systems are used to achieve these organizational objectives. Topics include general systems concepts and the systems approach to organization; role of computer technology in information systems design; economics of information; importance of data as a major organizational resource; information resource management; overview of information systems components: software, hardware, people, data flows and functional subsystems and their relation to the whole system. Examples are selected from such major subsystems as corporate planning, marketing, manufacturing, accounting, finance and personnel.

IS 676 Foundations of Social and Mobile Technologies

This course will explore the technical foundations of social and mobile technologies, and consider their impact on digital marketing, as well as other business contexts. The potential for social and mobile technology to serve as a new profit center for firms will be explored. Student assignments will involve the hands-on use and application of social and mobile technologies. Students will also learn how to create a simple mobile application for the iPhone, Android, or other relevant platforms. The final group project will consist of a social/mobile marketing project for a specific company or product.

IS 686: Social and Collaborative Computing

This course provides an introduction to how systems support social interaction and collaboration, and how social behaviors are shaped by technologies. The course is interdisciplinary, drawing from the fields of computer science, information systems, psychology, cognitive science, and sociology. It covers a variety of social and collaborative

computing environments and platforms such as collaboration tools, crowdwork platforms, social media, and various online communities. Students will have a chance to get experience with social data analyses and focus on design and evaluation of a social computing system as their final project for the course.

IS 679: Cognitive Science and Technology

The purpose of this course is to present major research and theories in the cognitive sciences and emerging technologies across diverse domains. Emphasis is placed on the interrelationships of cognition and technology and the role of cognition in the design and use of technology in real world settings. We address questions of importance for our increasingly technological society: How does technology augment human cognition? How our minds shape technology? The course is designed to (a) familiarize students with different cognitive science theories, (b) enable students to apply cognitive sciences theories in the design of technology, and (c) equip students with the knowledge to conduct research in this interdisciplinary domain.