

# Title of Program: MS in Human-Computer Interaction

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## 1 Program Description

Computing pervades contemporary life, from the continued and on-going transformation of the workplace, to the home; from formal settings of healthcare and wellbeing, to social settings of leisure and exercise; from the ability to solve complex problems with data and analytics, to the production of art and expressive media that challenge and celebrate the human condition. Creating compelling, useful, and usable computing interfaces to address the range of devices and settings computing impacts requires building on interdisciplinary knowledge that integrate an understanding of computer science, design, human factors, and human movement.

Northeastern University is a recognized national leader in the area of Human-Computer Interaction (HCI), currently ranked 7<sup>th</sup> in the U.S. at [csrankings.org](https://csrankings.org), and offers a unique program that trains students with a blend of analytic and creative approaches from computing, design, engineering, and movement science. The program is built around a curriculum that prepares students for critical industry leadership, providing the skills necessary for successful careers in the public and private sectors, as well as in research. The concentrations for this program align directly with the following industry sectors:

1. Software development including interaction design, web design, mobile app design, and interfaces for human-centered AI for a range of mass-market and specialty sectors.
2. Human-centered design for wearable and ubiquitous computing devices with a focus on human movement and ergonomics, including devices for healthcare, sport, and wellbeing.
3. Digital and expressive media design for interactive installations and experiences.

The proposed MS in Human-Computer Interaction degree program, a University Interdisciplinary Program (UIP), went through a multi-phase innovation and development review process administered by the Innovation Planning and Development (IPD) team. The program took shape from a nascent proposal from Khoury and CAMD to establish a master program in the area in order to fill an apparent gap in MS offerings given the national leadership in the field. The team conducted market research (supply and demand), a

competitive analysis, and a degree design process in collaboration with a working team of faculty.

The plan for the program is a Boston- and Oakland-based launch for domestic and international students who are recent graduates of STEM undergraduate degrees, and domestic mid-career professionals interested in broadening human-computer interaction design methodology and analytical skills across several industry sectors.

The program is planned for launch in fall 2026, with the first students arriving fall of 2027 taking 32 credits in one of four concentration areas. The program is a two-year program.

## **2 Program Contributions to the University's Mission**

The MS in Human-Computer Interaction would advance the university's mission by exemplifying its core commitment to interdisciplinary, experience-driven education that creates real-world impact. The program's integration of Computer Science and Design directly embodies the commitment to collaborative communities that leverage multiple areas of expertise to address complex societal challenges. By focusing on the intersection of technology and social impact, the program aligns perfectly with Northeastern's signature "humanics" approach, which fuses data and technology expertise with deep sensitivity to human needs. The program would prepare students to tackle critical challenges identified in the plan, including preparing them to tackle the complex implications of artificial intelligence, urban informatics, social determinants of health, and the complex interactions between technology and social justice.

The interdisciplinary nature of HCI as a field requires students to work across traditional boundaries between technical and human-centered disciplines and advances the University's goal of creating "globally mobile, culturally agile, partner-integrated, lifelong learners" who can navigate complex problems that do not fit neatly within traditional disciplinary silos. This program will attract students who, as the plan envisions, "want to make an impact" by equipping them with both the technical skills and human-centered design thinking necessary to create technologies that genuinely improve people's lives, broadening Northeastern's positive impact in the world.

The proposed program was developed in cooperation with faculty and leadership from the participating programs. Through this collaborative process facilitated by the IPD team, the proposed degree program links with relevant existing coursework where possible.

### **3 Program Market Analysis**

#### **3.1 What is the projected demand for the proposed program?**

Human-Computer Interaction represents a rapidly expanding field at the intersection of design, technology, and human behavior. To understand projected demand for this degree, we reviewed employment trends, degree completions, and skill requirements across related occupations and academic programs.

##### **Projected Student Demand:**

The field of Human-Computer Interaction has experienced extraordinary growth in recent years. According to the data analyzed, HCI programs have seen 108% growth in master's degree completions from 2019-2023, with 1,048 completions across 30 institutions. This represents one of the fastest-growing areas in graduate education, with leading institutions including Full Sail University (117 completions), University of Maryland (73 completions), and Indiana University (69 completions) in 2023.

To further estimate demand, we reviewed Northeastern enrollment data from related programs where there are overlapping competencies and career outcomes:

- **Design Programs:**
  - User Experience Design and related programs have shown consistent enrollment growth
  - Digital design competencies are increasingly integrated across multiple disciplines
- **Technology Programs:**
  - Data Analytics Engineering doubled in enrollments from 2021 to 2023, reaching 877 students
  - MS in AI grew to 165 enrollments since its 2020 launch
  - MS Data Science nearly doubled from 2021, reaching 415 enrollments in FY23
- **Interdisciplinary Programs:**
  - Programs combining technical and design skills show strong enrollment patterns
  - Cross-disciplinary offerings attract diverse student populations

Given the fall 2026 launch timeline, we project conservative initial enrollments of 15-20 students, growing to a steady state of 100-125 new students annually by Year 4, based on the demonstrated market demand and Northeastern's strong position in technology and design education.

### **3.2 What national, state, or local data can you provide to support the need for more people to be prepared by this program at this level?**

Labor market data demonstrates exceptional demand for HCI-trained professionals. According to Bureau of Labor Statistics projections and industry analysis:

#### **National Growth Projections (2023-2033):**

- Software Developers: 17% growth (much faster than average), median salary \$129.9K
- Web and Digital Interface Designers: 8% growth (faster than average), median salary \$114.0K
- Computer Systems Analysts: 11% growth (much faster than average), median salary \$91.0K
- UX/UI Designers: Expected to be the 8th fastest growing job by 2030 per World Economic Forum

**Job Posting Volume:** The demand is reflected in current hiring activity, with the following unique job postings from November 2023-2024:

- Software Developers: 4.58 million postings
- Web and Digital Interface Designers: 427,063 postings
- Computer Systems Analysts: 664,265 postings

These positions consistently require master's-level education for advancement, with educational requirements specifically citing degrees in HCI, UX Design, Human Factors, and related fields.

### **3.3 Describe employment opportunities in the field. What evidence is there that the program will attract high-quality students?**

The MS in Human-Computer Interaction prepares graduates for high-demand roles across diverse industries. Based on the competitive analysis and market research, graduates typically pursue positions such as:

- **UX/UI Designers** (54,760 unique postings) - designing user interfaces and experiences for digital products
- **UX Researchers** (28,448 unique postings) - conducting user research to inform design decisions
- **Product Designers** - leading end-to-end product development with median salaries exceeding \$124K
- **Interaction Designers** - creating interactive systems and interfaces
- **Front-End Developers** - implementing user-facing technologies
- **Usability Engineers** - ensuring products meet user needs and standards

Top employers in the Boston area actively recruiting HCI professionals include:

- Technology companies (LinkedIn, Salesforce, Meta)
- Healthcare organizations (Philips, Mass General)
- Financial services (Liberty Mutual)
- Consulting firms (Deloitte)
- Educational institutions (Harvard University)

The program will attract high-quality students based on several factors:

1. **Strong Employment Outcomes:** The data shows robust hiring across all HCI-related occupations, with competitive salaries ranging from \$90K-\$130K+ at the median level.
2. **Industry Alignment:** Our analysis of 19 comparable programs reveals that successful HCI programs emphasize four key areas where Northeastern has established strengths:
  - Computing/CS skills (10 programs)
  - Design/UX competencies (15 programs)
  - Engineering/Human Factors (10 programs)
  - Psychology/Human Behavior (7 programs)
3. **Market Positioning:** With an average cost per credit of \$1,680 across comparable programs (median \$1,660), Northeastern can competitively position this offering

drawing on the strength of its current reputation in computing, design, and engineering.

4. **Regional Advantage:** Boston's concentration of technology, healthcare, and education sectors creates unique opportunities for experiential learning and employment. Over 3,000 regional employers competed for HCI talent in recent years.

The convergence of strong student demand (108% growth in completions), exceptional job growth (particularly in software development and UX roles), and Northeastern's distinctive experiential learning model positions this program to attract and place high-caliber students in meaningful careers at the forefront of human-centered technology design.

## 4 Program Requirements

### 4.1 Key Program Differentiators

Northeastern University is a global leader at the forefront in the interdisciplinary field of human-computer interaction with faculty and researchers spread across four academic Colleges (College of Arts Media & Design, Khoury, Bouvé, and the College of Engineering). These core faculty and staff have the unique expertise to teach the innovative fundamental courses and the concentration areas comprising the MS HCI curriculum.

The MS in Human-Computer Interaction is a 32 credit degree program with 16 foundational core credits and 16-credit concentrations. Differentiators include the interdisciplinarity in the course content and course delivery (faculty) and the level of unique expertise represented in the faculty teaching the program (in Boston and in Oakland). The core capstone courses challenges students to take the new perspectives and skills gained from their chosen concentration area and integrate them through a cross-disciplinary capstone project.

The degree includes a number of experiential opportunities. Students participate in hands-on project-based research experiences that build on the skills gained at each stage of the program. Students pair concentration courses with applied methodology courses to marry their industry concentration skills with real-world application techniques. The degree program offers robust concentrations to demonstrate the array of industry applications of the degree. The degree is designed to grow demand for and awareness of human-computer interaction while meeting current market needs, particularly through the rapid evolution of AI and the need for human-centered AI design and implementation.

### 4.2 Admission Criteria

Applicants to the program must have a bachelor's degree or equivalent. Students whose bachelor's degrees are from a non-English speaking institution are required to demonstrate a TOEFL score of 79 or higher, an IELTS score of 6.5 or higher, a Pearson PTE

Academic score of 53 or higher, or a Duolingo English Test score of 105 or higher on the 160-point scale. A Memorandum of Understanding (MOU) among all colleges participating (providing courses and instructors) in the MS in Human-Computer Interaction will define the admissions process for students enrolling in this degree program. The degree will be awarded by the same college in which the student is admitted.

### 4.3 Degree Requirements

#### 4.3.1 Credit hour requirements

The MS in Human-Computer Interaction is a 32 credit degree program.

#### Core Requirements: 16 Credits

Course Code	Course Name	Credits
CS 5340	Computer/Human Interaction	4
ARTG 5120	Research Methods for Design	4
CS 5347	Understanding Users	4
or INAM 5347	Understanding Users	4
CS 6390	Human-Centered Computing Capstone	4
or INAM 6390	Human-Centered Computing Capstone	4

#### Concentrations: 16 Credits

##### ***Computing (Khoury)***

##### *Required Courses: 4 Hours*

Course Code	Course Name	Credits
CS 5170	Artificial Intelligence for Human-Computer Interaction	4
	<i>or</i>	
or CS 5345	Interactive Prototyping	4

##### *Elective Courses: 12 Hours*

Complete 12 semester hours of courses from the elective course list.

##### ***Design (CAMD)***

##### *Required Courses: 4 Hours*

Course Code	Course Name	Credits
ARTG 5910	Human-Centered Design	4

*Elective Courses: 12 Hours*

Complete 12 semester hours of courses from the elective course list.

### Human Machine Systems (COE)

*Required Courses: 8 Hours*

Course Code	Course Name	Credits
IE 6500	Human Performance	4
IE 7315	Human Factors Engineering	4

*Elective Courses: 8 Hours*

Complete 8 semester hours of courses from the elective course list.

### Human Movement Science (Bouvé)

*Required Courses: 8 Hours*

Course Code	Course Name	Credits
PT 7020	Technologies in Movement and Rehabilitation Sciences	4
PT 5170	Motor Control	3
and PT 5171	Motor Control Lab (1 SH) taken with PT 5170	1

*Elective Courses: 8 Hours*

Complete 8 semester hours of courses from the elective course list.

### Electives

Course Code	Course Name	Credits
ARTG 5130	Visual Communication for Information Design	4
ARTG 5320	Statistics for Design	4
ARTG 5330	Visualization Technologies 1: Fundamentals	4
ARTG 5610	Design Systems	4
ARTG 5710	Design for Dignity	4
ARTG 5910	Human-Centered Design	4
ARTG 6110	Information Design Theory and Critical Thinking	4
ARTG 6310	Design for Behavior and Experience	4
ARTG 6460	Human-centered AI	4
EXRE 5020	Developing Extended Realities (XR)	4
EXRE 5030	Designing Extended Realities (XR)	4
GSND 6320	Psychology of Play	4
GSND 6340	Biometrics for Design	4

GSND 5110	Game Design and Analysis	4
CS 5097	Mixed Reality	4
CS 5170	Artificial Intelligence for Human-Computer Interaction	4
CS 5345	Interactive Prototyping ( <i>pre-req for all CS electives for Design Concentration</i> )	4
CS 5520	Mobile Application Development	4
CS 5610	Web Development	4
CS 6120	Natural Language Processing	4
CS 6130	Affective Computing	4
CS 6350	Empirical Research Methods	4
CS 6760	Privacy, Security, and Usability	4
CS 7250	Information Visualization: Theory and Applications	4
CS 7260	Visualization for Network Science	4
CS 7390	Special Topics in Human-Centered Computing	4
HINF 5300	Personal Health Interface Design and Development	4
HLTH 5800	AI Across the Health Sciences	4
MUST 5510	Sound, Motion, and Computer Interaction (taught by Bouve faculty)	4
PT 7001	Core Concepts in Rehabilitation Science and Research	3
EXSC 5210	Physical Activity and Exercise: Prescription, Measurement and Testing	3
PT 5321	Applied Biomechanics	4
PT 7005	Experimental Design and Applied Statistics	4
PT 5170/71	Motor Control	4
PT 7020	Technologies in Movement and Rehabilitation Sciences	4
DADS 5640	Data Mining for Engineering Applications	4
DADS 6600	Computation and Visualization for Analytics	4
EMGT 5300	Engineering/Organizational Psychology	4
EMGT 6600	Engineering Team Performance	4
IE 5137	Computational Modeling in Industrial Engineering	4
IE 5630	Biosensor and Human Behavior Measurement	4
IE 6200	Engineering Probability and Statistics	4
IE 6500	Human Performance	4
IE 7315	Human Factors Engineering	4
IE 7215	Simulation Analysis	4
IE 7280	Statistical Methods in Engineering	4
ME 5665	Musculoskeletal Biomechanics	4
ME 6250	Wearable Robotics	4