Extended Realities, MS (Boston)

The Master of Science in Extended Realities seeks to open the new technologies, methods, practices, and skills of extended realities to students. XR includes augmented, virtual, and mixed reality. XR technologies have seen explosive growth over the last decade of mixed reality.

This program is structured to allow students flexibility and specialization to choose a path that matches their interest. Students have an opportunity to focus on a concentration area that matches their professional background and aspirations.

In this degree program, students are admitted to the college associated with their concentration, and their degree is awarded by that college. Students will follow all policies associated with their home college. The concentrations are associated with the following colleges:

- Khoury College of Computer Sciences
    - Artificial Intelligence
    - Human Computer Interaction
- D'Amore-McKim School of Business
    - Entrepreneurship
    - Marketing
- Bouvé College of Health Sciences
    - Human Movement Science
- College of Social Sciences and Humanities
    - Information Ethics
    - Public History
- College of Engineering
    - Wireless Networking
- College of Arts, Media and Design
    - XR and Design
    - XR and Games
    - XR and Media

The Master of Science in Extended Realities welcomes students from a diverse range of backgrounds because of the applications of XR technology used in many disciplines and industries including medicine, business, entertainment, architecture, and journalism.

Some concentrations may require a technical background and are noted in the requirements.

Program Requirements

Complete all courses and requirements listed below unless otherwise indicated.

Extended Reality Core

Code	Title	Hours
Required Courses		
EXRE 5010 and EXRE 5011	Immersive Media: Extended Realities (XR) History, Theory, and Impact and Seminar for EXRE 5010	5
EXRE 5020	Developing Extended Realities (XR)	4
EXRE 5030	Designing Extended Realities (XR)	4
EXRE 7500 or EXRE 7990	Extended Realities (XR) Project Thesis	4
GSND 5122	Business Models in the Game Industry	1

Extended Reality Concentration Options

Complete one of the following options:

- Artificial Intelligence (p. 2)—Khoury College of Computer Sciences
- Entrepreneurship (p. 2)—D'Amore-McKim School of Business
- Human Computer Interaction (p. 2)—Khoury College of Computer Sciences
- Human Movement Science (p. 2)—Bouvé College of Health Sciences
- Information Ethics (p. 3)—College of Social Sciences and Humanities
- Marketing (p. 3)—D'Amore-McKim School of Business
- Public History (p. 3)—College of Social Sciences and Humanities

- Wireless Networking (p. 4)—College of Engineering
- XR and Design (p. 4)—College of Arts, Media and Design
- XR and Games (p. 4)—College of Arts, Media and Design
- XR and Media (p. 4)—College of Arts, Media and Design

Program Credit/GPA Requirements

34 total semester hours required. Some concentrations may require more than 34 semester hours to complete.
Minimum 3.000 GPA required

CONCENTRATION IN ARTIFICIAL INTELLIGENCE—KHOURY COLLEGE OF COMPUTER SCIENCES

Code	Title	Hours
Requires a background in computer science.		
CS 5097	Mixed Reality	4
CS 5100	Foundations of Artificial Intelligence	4
CS 6120	Natural Language Processing	4
CS 6140	Machine Learning	4
or DS 5220	Supervised Machine Learning and Learning Theory	

CONCENTRATION IN ENTREPRENEURSHIP—D'AMORE-MCKIM SCHOOL OF BUSINESS

Code	Title	Hours
Required Courses		
INNO 6200	Enterprise Growth and Innovation	3
MKTG 6285	Creating Customer Value through Artificial Intelligence	3
Electives		
Complete 12 semester hours from the following:		12
ENTR 6210	Managing Operations in Early Stage Ventures	
ENTR 6212	Business Planning for New Ventures	
ENTR 6214	Social Enterprise	
ENTR 6218	Business Model Design and Innovation	
ENTR 6240	Emerging and Disruptive Technologies	
ENTR 6241	Entrepreneurial Marketing and Selling	
ENTR 6250	Lean Design and Development	
ENTR 6300	Managing a Technology-Based Business	
GE 5030	Iterative Product Prototyping for Engineers	
INNO 6230	Platform Innovation	
MKTG 6214	New Product Development	

CONCENTRATION IN HUMAN COMPUTER INTERACTION—KHOURY COLLEGE OF COMPUTER SCIENCES

Code	Title	Hours
Required Courses		
CS 5340	Computer/Human Interaction	4
Electives		
Complete 12 semester hours from the following:		12
ARTG 5710	Design for Dignity	
CS 5097	Mixed Reality	
CS 5170	Artificial Intelligence for Human-Computer Interaction	
CS 6350	Empirical Research Methods	
CS 7390	Special Topics in Human-Centered Computing	
GSND 6340	Biometrics of Design	

CONCENTRATION IN HUMAN MOVEMENT SCIENCE—BOUVÉ COLLEGE OF HEALTH SCIENCES

Code	Title	Hours
Required Courses		
GSND 6340	Biometrics of Design	4
PT 7001	Core Concepts in Rehabilitation Science and Research	3

PT 7005	Experimental Design and Applied Statistics	4
Electives		
Complete 7–8 semester hours from the following:		7-8
PT 5133	Kinesiology	
PT 5150	Motor Control, Development, and Learning	
PT 5321	Applications of Biomechanics in Human Function and Movement	
PT 5410	Functional Human Neuroanatomy	
PT 7010	Measurement and Analysis of Human Movement and Bioinstrumentation	
PT 7020	Technologies in Movement and Rehabilitation Science	

CONCENTRATION IN INFORMATION ETHICS—COLLEGE OF SOCIAL SCIENCES AND HUMANITIES

Code	Title	Hours
Required Courses		
Complete 8 semester hours from the following:		8
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
PHIL 5005	Information Ethics	
PHIL 5010	AI Ethics	
Electives		
Complete 8 semester hours from the following:		8
CY 5240	Cyberlaw: Privacy, Ethics, and Digital Rights	
PHIL 5001	Global Justice	
PHIL 5002	Ethics and Public Policy	
PHIL 5005	Information Ethics	
PHIL 5010	AI Ethics	

CONCENTRATION IN MARKETING—D'AMORE-MCKIM SCHOOL OF BUSINESS

Code	Title	Hours
Required Courses		
MKTG 6200	Creating and Sustaining Customer Markets	3
MKTG 6285	Creating Customer Value through Artificial Intelligence	3
Electives		
Complete 12 semester hours from the following:		12
MKTG 6210	Marketing Research	
MKTG 6212	International Marketing	
MKTG 6214	New Product Development	
MKTG 6216	Market Focused Strategy	
MKTG 6218	Managing Customer Engagement in a Service World	
MKTG 6222	Digital Marketing	
MKTG 6223	Brand and Advertising Management	
MKTG 6226	Consumer Behavior	
MKTG 6230	Driving Marketing Performance: Measure, Analyze, Profit	
MKTG 6234	Marketing Analytics	

CONCENTRATION IN PUBLIC HISTORY—COLLEGE OF SOCIAL SCIENCES AND HUMANITIES

Code	Title	Hours
Required Courses		
HIST 5237	Issues and Methods in Public History	4
Complete the following (repeatable) course twice:		4
HIST 8410	Fieldwork in History 1 (to be taken twice)	
Electives		
Complete 8 semester hours from the following:		8
HIST 5241	Exhibits and Museums	
HIST 7250	Topics in Public History (Public History and Slavery)	
HIST 7250	Topics in Public History (Sites of Violence and Public Memory)	

CONCENTRATION IN WIRELESS NETWORKING—COLLEGE OF ENGINEERING

Code	Title	Hours
Required Courses		
EECE 5512	Networked XR Systems	
EECE 7374	Fundamentals of Computer Networks	
Electives		
Complete 8 semester hours from the following:		8
EECE 5155	Wireless Sensor Networks and the Internet of Things	
EECE 5576	Wireless Communication Systems	
EECE 7364	Mobile and Wireless Networking	

CONCENTRATION IN XR AND DESIGN—COLLEGE OF ARTS, MEDIA AND DESIGN

Code	Title	Hours
Required Courses		
ARTG 5150 and ARTG 5151	Information Visualization Principles and Practices and Information Design Critique Seminar	4
ARTG 5640	Prototyping for Experience Design	4
EXRE 6500	Extended Realities (XR) Studio	4
Elective		
Complete 4 semester hours from the following:		4
ARTG 5310	Visual Cognition	
ARTG 5330	Visualization Technologies 1: Fundamentals	
ARTG 5600	Experience Design Studio 1: Principles	
ARTG 5610	Design Systems	
ARTG 5620	Notational Systems for Experience	
ARTG 6110	Information Design Theory and Critical Thinking	
ARTG 6310	Design for Behavior and Experience	
ARTG 6330	Information Design Mapping Strategies	

CONCENTRATION IN XR AND GAMES—COLLEGE OF ARTS, MEDIA AND DESIGN

Code	Title	Hours
Required Courses		
EXRE 6500	Extended Realities (XR) Studio	4
GSND 5110 and GSND 5111	Game Design and Analysis and Seminar for GSND 5110	5
Electives		
Complete 8 semester hours from the following:		8
GSND 6000	Advanced Topics in Game Design	
GSND 6001	Advanced Topics in Game Science	
GSND 6240	Exploratory Concept Design	
GSND 6250	Spatial and Temporal Design	
GSND 6330	Player Experience	
GSND 6340	Biometrics of Design	
GSND 6350	Data-Driven Game Design	
GSND 6460	Generative Game Design	

CONCENTRATION IN XR AND MEDIA—COLLEGE OF ARTS, MEDIA AND DESIGN

Code	Title	Hours
Required Courses		
EXRE 6500	Extended Realities (XR) Studio	4
JRNL 5400	Media and Advocacy in Theory and Practice	4
JRNL 6340	Fundamentals of Digital Journalism	4
Elective		
Complete 4 semester hours from the following:		4
ARTG 5150 and ARTG 5151	Information Visualization Principles and Practices and Information Design Critique Seminar	

JRNL 5311	Design for Storytelling
JRNL 6305	Topics
JRNL 6341	Telling Your Story with Data

Plan of Study
Sample Plan of Study

The following is a sample plan of study for a student in the Concentration in XR and Games.

Year 1

Fall	Hours	Spring	Hours
EXRE 5010 and EXRE 5011	5	EXRE 5030	4
EXRE 5020	4	GSND 5110 and GSND 5111	5
	9		**9**

Year 2

Fall	Hours	Spring	Hours
EXRE 6500	4	EXRE 7500	4
GSND 5122	1	XR and games elective 2	4
XR and games elective 1	4		
	9		**8**

Total Hours: 35