ARTIFICIAL INTELLIGENCE IN SOFTWARE ENGINEERING CONCENTRATION, SOFTWARE ENGINEERING (MS)

Course Requirements

Introductory Courses

Course	Title	Quarter Hours
CSC 400	DISCRETE STRUCTURES FOR COMPUTER SCIENCE	4
CSC 401	INTRODUCTION TO PROGRAMMING	4
CSC 402	DATA STRUCTURES I	4
CSC 403	DATA STRUCTURES II	4
IT 403	STATISTICS AND DATA ANALYSIS	4

Foundation Courses

Course	Title	Quarter Hours
CSC 421	APPLIED ALGORITHMS AND STRUCTURES	4
DSC 441	FUNDAMENTALS OF DATA SCIENCE	4
CSC 480	ARTIFICIAL INTELLIGENCE I	4
SE 433	SOFTWARE TESTING AND QUALITY ASSURANCE	4
or SE 441	CONTINUOUS DELIVERY AND DEVOPS	
SE 450	OBJECT-ORIENTED SOFTWARE DEVELOPMENT	4
or SE 456	ARCHITECTURE OF REAL-TIME SYSTEMS	
SE 475	MANAGING GLOBALLY DISTRIBUTED SOFTWARE DEVELOPMENT	4

Advanced Courses

Course	Title	Quarter Hours
DSC 478	PROGRAMMING MACHINE LEARNING APPLICATIONS	4
SE 488	AI-DRIVEN SOFTWARE DEVELOPMENT	4
SE 489	MACHINE LEARNING ENGINEERING FOR PRODUCTION (MLOPS)	4

Major Elective Courses

Twelve (12) credit hours of Major Elective Courses are required. SE courses in the 421-699 range and courses from the list below qualify as Major Elective Courses.

Software Development

Course	Title	Quarter Hours
CSC 436	WEB APPLICATIONS	
CSC 438	FRAMEWORK FOR WEB APPLICATION DEVELOPMENT	
CSC 453	PRINCIPLES OF DATABASE MANAGEMENT SYSTEMS	
CSC 461	OPTIMIZED C++	
CSC 471	MOBILE APPLICATION DEVELOPMENT FOR IOS	
CSC 472	MOBILE APPLICATION DEVELOPMENT FOR ANDROID	
CSC 552	CONCURRENT SOFTWARE DEVELOPMENT	
CSC 562	OPTIMIZED C++ MULTITHREADING	
SE 452	OBJECT-ORIENTED ENTERPRISE COMPUTING	
SE 453	ARCHITECTURE AND FRAMEWORKS FOR DEVELOPING CLIENT APPLICATIONS	
SE 459	AGILE SOFTWARE DEVELOPMENT	
SE 482	REQUIREMENTS ENGINEERING	
SE 533	SOFTWARE VALIDATION AND VERIFICATION	
SE 560	STRUCTURED DOCUMENT INTERCHANGE AND PROCESSING	

Software Architecture

Course	Title	Quarter Hours
SE 456	ARCHITECTURE OF REAL-TIME SYSTEMS	
SE 457	SERVICE-ORIENTED ARCHITECTURE	
SE 480	SOFTWARE ARCHITECTURE I	
SE 549	MODEL-DRIVEN SOFTWARE DEVELOPMENT	
SE 554	ENTERPRISE COMPONENT ARCHITECTURE	
SE 581	SOFTWARE ARCHITECTURE II	

Computer Security

Course	Title	Quarter Hours
CSC 439	COMPUTER SECURITY	
CSEC 450	DIGITAL FORENSIC TECHNIQUES (FORMERLY CNS 450)	
SE 525	SOFTWARE SECURITY ARCHITECTURE	
SE 526	SOFTWARE SECURITY ASSESSMENT	

Data Science

Course	Title	Quarter Hours
CSC 453	PRINCIPLES OF DATABASE MANAGEMENT SYSTEMS	
CSC 555	MINING BIG DATA	
CSC 575	INTELLIGENT INFORMATION RETRIEVAL	
DSC 423	DATA ANALYSIS AND REGRESSION	
DSC 424	ADVANCED DATA ANALYSIS	
DSC 425	TIME SERIES ANALYSIS AND FORECASTING	
DSC 441	FUNDAMENTALS OF DATA SCIENCE	
DSC 465	DATA VISUALIZATION	

Course	Title	Quarter Hours
DSC 478	PROGRAMMING MACHINE LEARNING APPLICATIONS	
DSC 540	ADVANCED MACHINE LEARNING	

Distributed Systems

Course	Title	Quarter Hours
CSC 435	DISTRIBUTED SYSTEMS I	
CSC 536	DISTRIBUTED SYSTEMS II	
CSC 552	CONCURRENT SOFTWARE DEVELOPMENT	

Project Management

Course	Title	Quarter Hours
CSEC 533	ENTERPRISE SECURITY INFRASTRUCTURE CONTROLS AND REGULATORY COMPLIANCE (FORMERLY CNS 533)	
SE 475	MANAGING GLOBALLY DISTRIBUTED SOFTWARE DEVELOPMENT	
SE 529	SOFTWARE RISK MANAGEMENT	
SE 579	ANALYTICS AND DATA MINING IN SOFTWARE ENGINEERING	
IS 468	ENTERPRISE SYSTEMS (FORMERLY IS 560)	
IS 535	INFORMATION TECHNOLOGY INVESTMENT FINANCIAL ANALYSIS	
IS 556	AGILE ENTERPRISE PROJECT MANAGEMENT	
IS 565	SOURCING FOR IT AND INNOVATION	

User Centered Development

Course	Title	Quarter Hours
HCI 430	PROTOTYPING AND IMPLEMENTATION	
HCI 440	INTRODUCTION TO USER-CENTERED DESIGN	
SE 453	ARCHITECTURE AND FRAMEWORKS FOR DEVELOPING CLIENT APPLICATIONS	
SE 546	SOFTWARE ARCHITECTURE AND DESIGN FOR DESKTOP APPLICATIONS	

Programming Languages and Compiler

Course	Title	Quarter Hours
SE 533	SOFTWARE VALIDATION AND VERIFICATION	
CSC 447	CONCEPTS OF PROGRAMMING LANGUAGES	
CSC 448	COMPILER DESIGN	
CSC 466	PROGRAM ANALYSIS	
CSC 548	ADVANCED COMPILER DESIGN	
CSC 535	FORMAL SEMANTICS OF PROGRAMMING LANGUAGES	

Gaming and Entertainment Technology

Course	Title	Quarter Hours
CSC 486	REAL-TIME NETWORKING (FORMERLY GAM 490)	
GAM 453	TOOL PROGRAMMING FOR GAME DEVELOPMENT	
GAM 475	REAL - TIME SOFTWARE DEVELOPMENT	
GAM 575	REAL-TIME SOFTWARE DEVELOPMENT II	
SE 456	ARCHITECTURE OF REAL-TIME SYSTEMS	

Software Engineering Research

Course	Title	Quarter Hours
SE 695 & SE 696	MASTER'S RESEARCH and MASTER'S PROJECT	
SE 695 & SE 698	MASTER'S RESEARCH and MASTER'S THESIS	
CSC 500	RESEARCH COLLOQUIUM	

Capstone

Course	Title	Quarter Hours
SE 491	SOFTWARE ENGINEERING STUDIO	
DSC 672	DATA SCIENCE CAPSTONE	

The Master's Project or Thesis must represent an original contribution to the area, and may include system development, empirical studies, or theoretical work. The scope and the details of the research project will be determined by the research supervisor, and must be approved by the student's academic advisor.