



2025-2026 Core & Concentrations

[Stellic Degree Planner](#)

[Schedule of Classes](#)

MCDS Graduation Requirements:
MCDS Core Courses
Capstone Requirement
One Set of Concentration Courses
One Elective (any 600+ level SCS course)

Analytics Concentration Requirements:

1 x Big Data
1 x Machine Learning
1 x Analytics Systems

Machine Learning

10-605 Machine Learning with Large Datasets
10-617 Intermediate Deep Learning
10-623 Generative AI
10-624 Bayesian Methods in Machine Learning
10-701 Introduction to Machine Learning (PhD)
10-703 Deep Reinforcement Learning & Control
10-707 Advanced Deep Learning
10-708 Probabilistic Graphical Models
10-714 Deep Learning Systems: Algorithms and Implementation
10-716 Advanced Machine Learning: Theory & Methods
10-725 Optimization for Machine Learning
11-641 Machine Learning for Graphs
11-667 Large Language Models Methods and Applications
11-685 Introduction to Deep Learning
11-767 On-Device Machine Learning
11-777 Multimodal Machine Learning
11-785 Introduction to Deep Learning
11-891 Neural Code Generation
36-705 Intermediate Statistics
36-708 Statistical Methods in Machine Learning

Analytics Systems

10-605 Machine Learning with Large Datasets
10-708 Probabilistic Graphical Models
10-714 Deep Learning Systems: Algorithms and Implementation
11-642 Search Engines
17-645 Machine Learning in Production
11-711 Advanced Natural Language Processing
11-737 Multilingual Natural Language Processing
11-751 Speech Recognition and Understanding
11-767 On-Device Machine Learning
11-775 Large Scale Multimedia Analysis
11-797 Question Answering
11-868 Large Language Model Systems
11-877 Advanced Topics in Multimodal Machine Learning
15-642 Machine Learning Systems
15-884 Machine Learning Systems

Big Data

10-791 Representation Learning
11-641 Machine Learning with Graphs
11-663 Applied Machine Learning
11-667 Large Language Models Methods and Applications
11-688 Concepts in Digital Multimedia and Cyber Forensics
11-692 Speech Technology for Conversational AI
11-711 Advanced Natural Language Processing
11-737 Multilingual Natural Language Processing
11-751 Speech Recognition and Understanding
11-755 Machine Learning for Signal Processing
11-775 Large Scale Multimedia Analysis
11-777 Multimodal Machine Learning
11-788 Computational Forensics & AI
11-877 Advanced Topics in Multimodal Machine Learning
11-891 Neural Code Generation
15-686 Neural Computation
16-824 Visual Learning and Recognition

**Human-Centered Data Science
Concentration Requirements:**

1x Research Methods
2x HCI

Research Methods

05-610 User Centered Research & Evaluation
05-816 Applied Research Methods

**Human-
Computer
Interaction**

05-615 Persuasive Design
05-617 Design of Artificial Intelligence Products
05-618 Human AI Interaction
05-660 Interaction Design Fundamentals
05-813 Human Factors
05-818 Design of Educational Games
05-823 E-Learning Design Principles and Methods
05-833 Applied Gadgets, Sensors and Activity Recognition in HCI
05-836 Usable Privacy and Security
05-840 Tools for Online Learning
05-872 Rapid Prototyping of Computer Systems
05-891 Designing Human Centered Systems
05-899 Crowd Programming
05-899 Learning Analytics and Educational Data Science
05-899 AI: Design for the Long Term
05-899 FATE (Fairness, Accountability, Transparency, and Ethics) in Sociotechnical Systems
05-899 Interactive Extended Reality
05-899 Justice through Design
05-899 Transformational Game Design Studio

MCDS CORE

**10-601 Machine
Learning**

**15-619
Cloud
Computing**

**11-637
Foundations of
Computational
Data Science**

**05-839
Interactive
Data Science**

**11-631
Data Science
Seminar**

**Systems Concentration
Requirements:**

3 x Systems Project

Systems Projects

11-868 Large Language Model Systems
15-605 Operating System Design and Implementation
15-611 Compiler Design
15-618 Parallel Computer Architecture and Programming
15-640 Distributed Systems
15-641 Networking and the Internet
15-642 Machine Learning Systems
15-645 Database Systems
15-712 Advanced Operating Systems and Distributed Systems
15-719 Advanced Cloud Computing
15-721 Database Systems
15-746 Storage Systems
15-821 Mobile and Pervasive Computing

Capstone Requirements:

Capstone Planning Seminar
Internship
2 x Capstone Courses

Capstone Requirement

11-630 Internship
11-632 Data Science Capstone
11-634 Capstone Planning Seminar
11-635 Capstone Research