2022-2023 Core & Concentrations

**Analytics Concentration**
Requirements:
1 x Big Data
1 x Machine Learning
1 x Software Systems

- 10-605 Machine Learning with Large Datasets
- 10-745 Scalability in Machine Learning
- 11-641 Machine Learning for Text/Graph Mining
- 11-775 Large Scale Multimedia Analysis
- 11-777 Multimodal Machine Learning

**Systems Concentration**
Requirements:
3 x Systems Project

- 15-605 Operating Systems Implementation
- 15-618 Parallel Computer Arch. & Prog.
- 15-640 Distributed Systems
- 15-641 Computer Networks
- 15-645 Database Systems
- 15-712 Advanced and Distributed OS
- 15-719 Advanced Cloud Computing
- 15-721 Advanced Databases
- 15-746 Advanced Storage Systems
- 15-821 Mobile and Pervasive Computing
- 15-884 Machine Learning Systems

**Machine Learning**

- 10-617 Intermediate Deep Learning
- 10-618 Machine Learning for Structured Data
- 10-781 Introduction to Machine Learning (PhD)
- 10-783 Deep Reinforcement Learning & Control
- 10-787 Advanced Deep Learning
- 10-788 Probabilistic Graphical Models
- 10-714 Deep Learning Algorithms and Impl.
- 10-715 Advanced Intro to Machine Learning
- 10-716 Advanced ML Theory and Methods
- 11-685 Introduction to Deep Learning
- 11-767 On-Device Machine Learning
- 11-785 Introduction to Deep Learning
- 11-877 Advanced Multimodal Machine Learning
- 36-785 Intermediate Statistics
- 36-788 Statistical Methods in ML
- 11-663 Applied Machine Learning
- 11-711 Advanced Natural Language Processing
- 11-737 Multilingual NLP
- 11-755 Machine Learning for Signal Processing

**Software Systems**

- 11-642 Search Engines
- 11-688 Digital Multimedia & Cyber Forensics
- 11-695 Machine Learning in Production
- 11-751 Speech Recognition and Understanding
- 11-797 Question Answering
- 11-830 Computational Ethics for NLP
- 15-884 Machine Learning Systems

**Research Methods**

- 05-617 Design of AI Products
- 05-618 Human AI Interaction
- 05-891 Designing Human Centered Systems
- 05-813 Human Factors
- 05-821 Social Web
- 05-823 E-Learning Design Principles and Methods
- 05-840 Tools for Online Learning
- 05-833 Applied Gadgets & Sensors in HCI
- 05-836 Usable Privacy and Security
- 05-872 Rapid Prototyping of Computer Systems
- 05-890 Crowd Programming
- 05-899 Analytics & Educational Data Science
- 05-899 AI: Design for the Long Term
- 05-899 Fairness, Accountability, Transparency, & Ethics
- 05-899 AI: Design for the Long Term
- 05-899 Persuasive Design
- 05-899 Social Data Science
- 05-899 Transformational Game Design Studio

**Human-Computer Interaction**

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

**Capstone Requirement**
Capstone Planning Seminar
Internship
2 x Capstone Courses

**MCDS Core Courses**

- 10-601 Machine Learning
- 11-637 Foundations of Computational Data Science
- 05-839 Interactive Data Science
- 11-631 Data Science Seminar
- 11-634 Capstone Planning Seminar
- 11-630 Internship
- 11-632 Data Science Capstone
- 11-635 Capstone Research

**MCDS Graduation Requirements**

- One Set of Concentration Courses
- One Elective (any 600+ level SCS course)

**Stellic Degree Planner**

**Schedule of Classes**

**Analytics Concentration Requirements:**
- 1 x Big Data
- 1 x Machine Learning
- 1 x Software Systems

**Systems Concentration Requirements:**
- 3 x Systems Project

**Human-Centered Data Science Concentration Requirements:**
- 1 x Research Methods
- 2 x HCI