

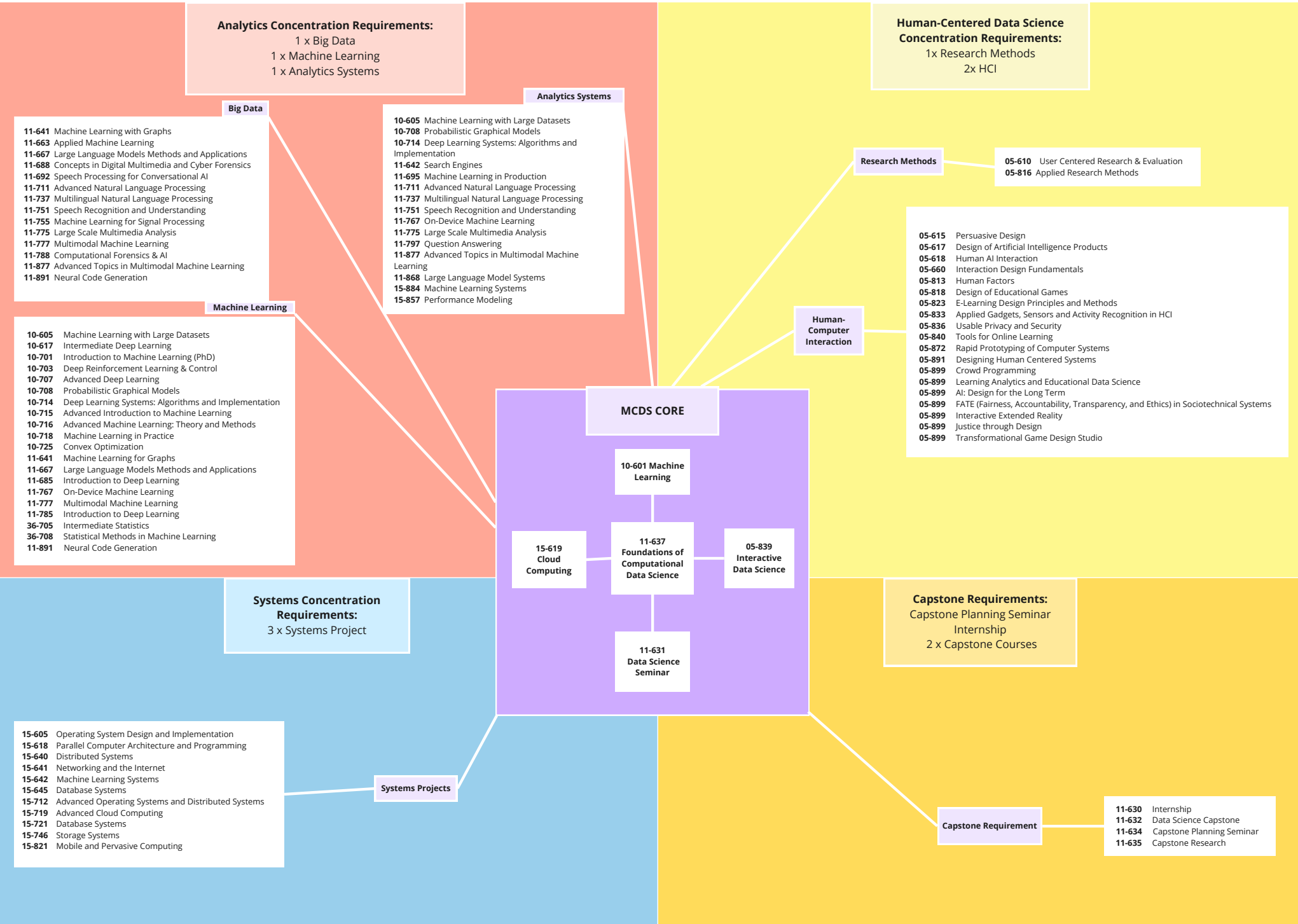


2024-2025 Core & Concentrations

[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

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

Big Data

- 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 Processing 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

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
- 11-695 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
- 11-877 Advanced Topics in Multimodal Machine Learning
- 11-868 Large Language Model Systems
- 15-884 Machine Learning Systems
- 15-857 Performance Modeling

Machine Learning

- 10-605 Machine Learning with Large Datasets
- 10-617 Intermediate Deep 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
- 10-715 Advanced Introduction to Machine Learning
- 10-716 Advanced Machine Learning: Theory and Methods
- 10-718 Machine Learning in Practice
- 10-725 Convex Optimization
- 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
- 36-705 Intermediate Statistics
- 36-708 Statistical Methods in Machine Learning
- 11-891 Neural Code Generation

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

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

Systems Concentration Requirements:
3 x Systems Project

Systems Projects

- 15-605 Operating System Design and Implementation
- 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