



Carnegie Mellon University

Master of Computational Data Science

2022-2023 Core & Concentrations

MCDS Graduation Requirements
MCDS Core Courses
Capstone Requirement
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

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

Big Data

Machine Learning

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

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

Systems Projects

15-619 Cloud Computing

11-637 Foundations of Computational Data Science

05-839 Interactive Data Science

11-631 Data Science Seminar

MCDS Core

Research Methods

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

Human-Computer Interaction

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
05-899 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-Centered Data Science Concentration

Requirements:
1 x Research Methods
2 x HCI

Capstone Requirement

Capstone Requirement
Capstone Planning Seminar
Internship
2 x Capstone Courses

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

10-617 Intermediate Deep Learning
10-618 Machine Learning for Structured Data
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 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
36-705 Intermediate Statistics
36-708 Statistical Methods in ML
10-725 Convex Optimization
11-663 Applied Machine Learning
11-711 Advanced Natural Language Processing
11-737 Multilingual NLP
11-755 Machine Learning for Signal Processing