Carnegie Mellon University
Master of Computational Data Science

2020-2021 Core & Concentrations

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

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

[Stellic Degree Planner](#)

[Schedule of Classes](#)

10-617	Intermediate Deep Learning
10-701	Introduction to Machine Learning (Ph.D.)
10-703	Deep Reinforcement Learning & Control
10-707	Advanced Deep Learning
10-708	Probabilistic Graphical Models
10-715	Advanced Introduction to Machine Learning
10-716	Advanced ML: Theory & Methods
10-718	Data Analysis
10-725	Convex Optimization
11-661	Language and Statistics
11-755	Machine Learning for Signal Processing
11-777	Multimodal Machine Learning
11-785	Introduction to Deep Learning
36-705	Intermediate Statistics
36-708	Statistical Methods in Machine Learning

10-605	Machine Learning with Large Data Sets
10-805	Machine Learning with Large Data Sets
11-641	Machine Learning for Text Mining
11-775	Large-Scale Multimedia Analysis
11-777	Multimodal Machine Learning

11-642	Search Engines
11-737	Multilingual NLP
11-747	Neural Networks for NLP
11-788	Computational Forensics & AI
11-797	Question Answering
11-830	Computational Ethics for NLP

Big Data

Machine Learning

Software Systems

Systems Concentration
Requirements:
3 x Systems Project

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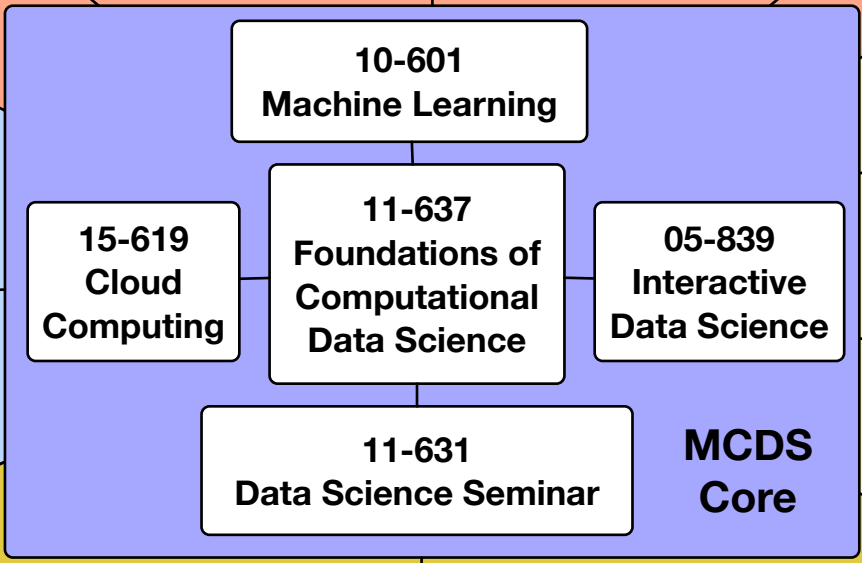2 x HCI

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

Systems Projects

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 and Evaluation
05-816	Applied Research Methods

Human-Computer Interaction

05-618	Human AI Interaction
05-891	Designing Human Centered Systems
05-813	Human Factors
05-821	Applied Research Methods: Qualitative
05-823	E-Learning Design Principles and Methods
05-840	Tools for Online Learning
05-833	Gadgets, Sensors & Activity Recognition
05-836	Usable Privacy and Security
05-838	The Role of Tech in 21st Century Learning
05-872	Rapid Prototyping of Computer Systems
05-899	Crowd Programming
05-899	Learning Analytics and Educational DS
05-899	AI: Design for the Long Term
05-899	Fairness, Accountability, Transparency & Ethics
05-899	Persuasive Design
05-899	Social Data Science
05-899	Transformational Game Design Studio

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**