Name:

- Must maintain an overall 3.0 GPA (B average)
- Degree must be completed within 5 years

Complete 32 Credit Hours
- Breadth Requirement (16 hrs) - Total Credit Hours Completed
- Advanced Coursework (12 hrs) - Total Credit Hours Completed
- Additional Coursework (4 hrs) - Total Credit Hours Completed

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BREADTH REQUIREMENTS: 12-16 credit hours

- Must complete at least one course from four different areas with a grade of B- or higher. (Accompanying MOOC courses are listed within parenthesis after the High-Engagement course title.)

### Artificial Intelligence *
- CS 441 (formerly CS 498) Applied Machine Learning
- CS 445 Computational Photography**
- CS 447 Natural Language Processing
- CS 598 Deep Learning for Healthcare [Recommended prereq: CS 441]***

### Database and Information Systems *
- CS 410 Text Information Systems (Text Retrieval & Search Engines + Text Mining & Analytics)
- CS 411 Database Systems
- CS 412 Intro to Data Mining (Pattern Discovery + Cluster Analysis)

### Interactive Computing (Graphics / HCI) *
- CS 416 (formerly CS 498) Data Visualization (Data Visualization)
- CS 418 Interactive Computer Graphics
- CS 445 Computational Photography**
- CS 519 Scientific Visualization [Recommended prereq: CS 416 or CS 418]***

### Parallel Computing
- CS 484 Parallel Computing

### Programming Languages & Software Engineering
- CS 421 Programming Languages and Compilers
- CS 427 Software Engineering I

### Scientific Computing
- CS 450 Numerical Analysis

### Security and Privacy
- CS 463 Computer Security II

### Systems & Networking *
- CS 425 Distributed Systems (Cloud Computing Concepts: Parts 1 & 2)
- CS 435 (formerly CS 498) Cloud Networking
- CS 437 (formerly CS 498) Internet of Things
- CS 498 Cloud Computing Applications (Cloud Computing Applications: Parts 1 & 2)

Total Credit Hours from Breadth Coursework - 12-16 credit hours

ADVANCED COURSEWORK: 12 credit hours (Any three courses from the list below; Grades must be C or higher)

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### 500-LEVEL Courses (500-590 or 598)
- CS 513 Theory & Practice of Data Cleaning
- CS 519 Scientific Visualization [Recommended prereq: CS 416 or CS 418]***
- CS 598 Advanced Bayesian Modeling
- CS 598 Practical Statistical Learning [Required prereq: CS 410, CS 412; an Artificial Intelligence breadth course, or STAT 420]
- CS 598 Deep Learning for Healthcare [Recommended prereq: CS 441]***
- CS 598 Foundations of Data Curation
- CS 598 Data Mining Capstone [Required prereq: CS 410 and CS 412]
- CS 598 Cloud Computing Capstone [Required prereqs: CS 498 Cloud Computing Applications and one other Cloud Computing breadth course]

Total Credit Hours from Advanced Coursework - 12 credit hours

ADDITIONAL COURSEWORK: 4-8 hours (Grade must be C or higher)

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- STAT 420 Methods of Applied Statistics - Statistical Modeling in R

Or any other course from "Breadth Requirements" or "Advanced Coursework"

Total Credit Hours from Additional Coursework (4-8 credit hrs)

* Breadth area coursework required for the MCS-Data Science track
** CS 445 will be applied toward only one of the breadth areas
*** If CS 519 or CS 598 DLH is applied toward both the breadth and advanced coursework requirements, then 8 hours of "Additional Coursework" is required.