

MSCS DEGREE REQUIREMENTS FORM *last revised (05/07/2024)*

First Name: _____ Last Name: _____ N number: _____

Required: 36 credits of approved coursework

- **21** credits - standard graduate CS classroom-based courses.

Course _____ Semester _____ Grade _____ Credits: _____
Course _____ Semester _____ Grade _____ Credits: _____

- **6** credits - standard graduate CS, Math and Data Science classroom-based courses; independent study; MS thesis (no external internships) Independent study and master's thesis require DGS approval (MS Thesis fulfills the Capstone requirement, see page 2 under Requirement C).

Course _____ Semester _____ Grade _____ Credits: _____
Course _____ Semester _____ Grade _____ Credits: _____

- Remaining **9** credits in any of above or: credits transferred from graduate study in CS; external internship; and relevant graduate courses. At most 6 credits of external internship. Relevant graduate courses and external internships require DGS approval.

Course _____ Semester _____ Grade _____ Credits: _____
Course _____ Semester _____ Grade _____ Credits: _____
Course _____ Semester _____ Grade _____ Credits: _____

Requirement A: A student must take the three foundational courses and maintain a GPA of 2.667 or better in the courses:

CSCI-GA 1170-001 Fundamental Algorithms Semester _____ Grade _____ Credits: _____ Placed Out _____
CSCI-GA 2110-001 Programming Languages Semester _____ Grade _____ Credits: _____ Placed Out _____
CSCI-GA 2250-001 Operating Systems Semester _____ Grade _____ Credits: _____ Placed Out _____

Requirement B: A student must pass **ONE** course in **TWO** of the following four designated application areas

Course _____ Semester _____ Grade _____ Credits: _____
Course _____ Semester _____ Grade _____ Credits: _____

Graphics

- ❖ Advanced Computer Graphics
- ❖ Advanced Computer Vision
- ❖ Computational Geometry
- ❖ Computer Graphics
- ❖ Computer Vision
- ❖ Computer Vision for Science and Engineering
- ❖ Geometric Modeling

- ❖ Graphics Processing Units (GPUs): Architecture and Programming
- ❖ Integrating Machine Learning to Computer Vision
- ❖ Introduction to Computer Vision
- ❖ Learning with Large Language and Vision Models
- ❖ Social Multiplayer Games
- ❖ Virtual Reality
- ❖ Vision Meets Machine Learning

Computation for Science and Society

- ❖ Applied Cryptography and Network Security
- ❖ Bioinformatics and Genomics
- ❖ Blockchain and Its Applications
- ❖ Convex and Nonsmooth Optimization
- ❖ Cryptocurrencies and Decentralized Ledgers
- ❖ Data Analytics and Visualization in Healthcare
- ❖ Data Science for Health
- ❖ Financial Software Projects
- ❖ High Performance Computing
- ❖ Immersed Boundary Method
- ❖ Information and Communication Technology for Developing Countries
- ❖ Introduction to Agent-Based Modeling
- ❖ Introduction to Cryptography
- ❖ Linear Programming
- ❖ Machine Learning for Healthcare
- ❖ Monte Carlo Methods

- ❖ Music Software Projects
- ❖ Nonlinear Optimization
- ❖ Numerical Methods I
- ❖ Numerical Methods II
- ❖ Numerical Optimization
- ❖ Practical Computer Security
- ❖ Randomized Numerical Linear Algebra
- ❖ Responsible Data Science
- ❖ Scientific Computing
- ❖ Security and Privacy
- ❖ Speech Recognition
- ❖ Social Networks
- ❖ Stochastic modeling and uncertainty quantification in complex systems
- ❖ Technologies for Finance
- ❖ Topics in Digital Media
- ❖ Topics in Numerical Analysis
- ❖ Values Embodied in Information & Communications Technology

Intelligent Systems

- ❖ Advanced Computer Vision
- ❖ Advanced Machine Learning
- ❖ Advanced Topics in Natural Language Processing
- ❖ Artificial Intelligence
- ❖ Bayesian Machine Learning
- ❖ Big Data: Large Scale Machine Learning
- ❖ Big Data and ML Systems
- ❖ Big Data Science
- ❖ Cloud and Machine Learning
- ❖ Computer Vision
- ❖ Computer Vision for Science and Engineering
- ❖ Conceptual Gaps in Modern Machine Learning
- ❖ Data Analytics and Visualization in Healthcare
- ❖ Data Mining
- ❖ Deep Generative Models
- ❖ Deep Learning
- ❖ Deep Reinforcement Learning
- ❖ Foundations of Deep Learning Theory
- ❖ Foundations of Machine Learning
- ❖ Heuristic Problem Solving
- ❖ High Performance Computing for Machine Learning

- ❖ High Performance Machine Learning
- ❖ Integrating Machine Learning to Computer Vision
- ❖ Introduction to Data Science
- ❖ Introduction to Deep Learning Systems
- ❖ Introduction to Machine Learning
- ❖ Learning with Large Language and Vision Models
- ❖ Logic in Computer Science
- ❖ Machine Learning
- ❖ Machine Learning for Healthcare
- ❖ Mathematics of Deep Learning
- ❖ Natural Language Processing
- ❖ Predictive Analytics
- ❖ Probabilistic Graphical Models
- ❖ Responsible Data Science
- ❖ Robot Motion Planning
- ❖ Social Multiplayer Games
- ❖ Statistical Natural Language Processing
- ❖ Vision Meets Machine Learning
- ❖ Web Search Engines

Databases

- ❖ Advanced Database Systems
- ❖ Big Data
- ❖ Database Systems

- ❖ Distributed Systems
- ❖ Realtime & Big Data Analytics
- ❖ Big Data Application Development

Requirement C: A student must complete a designated capstone course with the grade of B (3.0) or better. Alternatively, subject to requirements and prior approval of the DGS, a student may complete a master's thesis or a capstone advanced lab.

Course _____ Semester _____ Grade _____ Credits: _____

- * Advanced Computer Graphics
- * Advanced Database Systems
- * Big Data and ML Systems
- * Cloud and Machine Learning
- * Cloud Computing
- * Compiler Construction
- * Deep Reinforcement Learning
- * Distributed Systems
- * Geometric Modeling

- * Graphics Processing Units (GPUs): Architecture & Programming
- * High Performance Computing
- * High Performance Machine Learning
- * Info Tech Projects
- * Multicore Processors: Architecture & Programming
- * Networks & Mobile Systems
- * Software Engineering
- * Virtual Reality