MSCS DEGREE REQUIREMENTS FORM *last revised (03/12/2024)*

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: ____

  Course _____ Semester_____ Grade_____ Credits: ____

  Course _____ Semester_____ Grade_____ Credits: ____

  Course _____ Semester_____ Grade_____ Credits: ____

  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.

  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
- 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