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
- Geometric Modeling

**Computations 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

**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
- 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

**Databases**
- Advanced Database Systems
- Big Data
- Database Systems

**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 and Programming
- High Performance Computing
- High Performance Machine Learning
- Info Tech Projects
- Multicore Processors: Architecture & Programming
- Networks & Mobile Systems
- Software Engineering
- Virtual Reality

- 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

- 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

- 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
- 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

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