Data Science and Engineering, MS — 2020-2021

College of Engineering

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The MS in Data Science and Engineering (CDSE) is an interdisciplinary graduate program designed for students who seek to use computing and data science and engineering to solve problems involving big data, extensive computations, and complex modeling, simulation, optimization and visualization.

The mission of the Department of Computational Data Science and Engineering is to graduate professionals who (a) have expertise in developing novel computational and data science methodologies and products, and/or (b) have extended their expertise in specific disciplines (in science, technology, engineering, and socioeconomics) with data science and engineering tools.

Research in Data Science and Engineering includes: big data and computational statistics, AI and Machine Learning, internet of things, large and complex systems, intelligent transportation and infrastructure systems, remote sensing, autonomous vehicles, virtual and augmented reality, e-commerce, image and video processing, scientific and interactive visualization, high-performance computing, scalable algorithms, bioinformatics, and multi-scale multi-physics engineering systems.

Additional Admission Requirements
- An approved Bachelor of Science or Engineering degree with a minimum GPA of 3.00/4.00 is required. A working knowledge of statistics, matrices, or linear algebra, and experience in programming are desirable

Program Outcomes:
- Graduates shall demonstrate expertise, critical thinking and the ability to conduct research and development in scalable computing, computational methods, artificial and computational intelligence, complex system modeling and simulation, and data science and engineering.
- Graduates shall have mastery of communicating, planning, and implementing solutions and research and development products in computational approaches in various applications in science, technology, engineering, and mathematics, including the use of advanced visualization and analytics techniques.
- Graduates shall develop skills and abilities to be effective educators and practitioners in data science and engineering
- Graduates shall acquire the ability to conduct significant research and development projects.

Degree Requirements

Total credit hours: 30
- Core courses (12 credits): CSE 620, 704, 708, 817

Thesis option
- Electives (9 credits): Take 9 credits from engineering, computer science, mathematics, physics, chemistry, biology, economics, business, agricultural science or other courses approved by the CSE department, with approval of advisor
- Select 2 additional credits to complete 30 credit requirement with approval of advisor. This can be thesis hours, continuation/residency credits, supervised teaching, supervised research, or approved graduate courses with approval of advisor
- At least 18 credit hours should be at 600-700 level
- Seminar (CSE 792: 1 credit)
- Thesis (CSE 797: 6 credits)

- Pass thesis defense

Project option
- Electives (12 credits): Take 12 credits from engineering, computer science, mathematics, physics, chemistry, biology, economics, business, agricultural science or other courses approved by the CSE department, with approval of advisor
- Select 2 additional credits to complete 30 credit requirement with approval of advisor. This can be continuation/residency credits, supervised teaching, supervised research, or approved graduate courses with approval of advisor
- At least 18 credit hours should be at 600-700 level
- Seminar (CSE 789: 1 credit)
- Project (CSE 796: 3 credits)

Course-only option
- Electives (15 credits): Take 15 credits from engineering, computer science, mathematics, physics, chemistry, biology, economics, business, agricultural science or other courses approved by the CSE department, with approval of advisor
- Select 2 additional credits to complete 30 credit requirement with approval of advisor. This can be continuation/residency credits, supervised teaching, supervised research, or approved graduate courses with approval of advisor
- Seminar (CSE 789: 1 credit)
- At least 18 credit hours should be at 600-700 level