DATA SCIENCE - M.S.

College of Arts and Sciences
Department of Mathematical Sciences
Department of Computer Science
www.kent.edu/math

About This Program

The Data Science M.S. program provides you with the theoretical knowledge and practical experience needed to succeed in today's data-driven world. With hands-on learning opportunities, experienced faculty and cutting-edge technology, you'll be prepared to solve complex data challenges and make an impact in your field. Read more...

Contact Information

- Program Coordinator: **Hassan Peyravi** | gradinfo@cs.kent.edu | 330-672-9047
- Connect with an Admissions Counselor: U.S. Student | International Student

Program Delivery

- **Delivery:**
  - In person
- **Location:**
  - Kent Campus

Examples of Possible Careers and Salaries*

Data scientists and mathematical science occupations, all other

- 30.9% much faster than the average
- 33,200 number of jobs
- $98,230 potential earnings

Computer and information research scientists

- 15.4% much faster than the average
- 32,700 number of jobs
- $126,830 potential earnings

Statisticians

- 34.6% much faster than the average
- 42,700 number of jobs
- $92,270 potential earnings

Computer and information systems managers

- 10.4% much faster than the average
- 461,000 number of jobs
- $151,150 potential earnings

Management analysts

- 10.7% much faster than the average
- 876,300 number of jobs
- $87,660 potential earnings

Database administrators and architects

- 9.7% much faster than the average
- 132,500 number of jobs
- $98,860 potential earnings

Computer programmers

- -9.4% decline
- 213,900 number of jobs
- $89,190 potential earnings

Software developers and software quality assurance analysts and testers

- 21.5% much faster than the average
- 1,469,200 number of jobs
- $110,140 potential earnings

* Source of occupation titles and labor data comes from the U.S. Bureau of Labor Statistics' Occupational Outlook Handbook. Data comprises projected percent change in employment over the next 10 years; nation-wide employment numbers; and the yearly median wage at which half of the workers in the occupation earned more than that amount and half earned less.

For more information about graduate admissions, visit the graduate admission website. For more information on international admissions, visit the international admission website.

Admission Requirements

- Bachelor's degree from an accredited college or university
- Minimum 3.000 undergraduate GPA (on a 4.000-point scale)
- Prerequisite mathematics and computer science courses[1]
- Official transcript(s)
- *Effective for fall 2024 admission term, GRE scores will be required*
- Two letters of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning one of the following:
  - Minimum 525 TOEFL PBT score
  - Minimum 71 TOEFL IBT score
  - Minimum 74 MELAB score
  - Minimum 6.0 IELTS score
  - Minimum 50 PTE score
  - Minimum 100 Duolingo English score

[1] Students entering the program are expected to have previously completed courses in linear algebra (equivalent to MATH 21001 or MATH 21002), statistics (equivalent to MATH 20011), advanced calculus (equivalent to MATH 22005), discrete mathematics/structures (equivalent to MATH 31011 or CS 23022), programming and data structures (equivalent to CS 23001) and database systems (equivalent to CS 33007). Applicants have not completed all the prerequisite courses may be admitted conditionally (based on a wholistic review

of their application) until they complete the remaining courses being before beginning the program's coursework.

Application Deadlines

- **Fall Semester**
  - Application deadline: June 15
- **Spring Semester**
  - Application deadline: November 1
- **Summer Term**
  - Application deadline: April 1

Applications submitted after these deadlines will be considered on a space-available basis.

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements		
CS 63005	ADVANCED DATABASE SYSTEMS DESIGN	3
CS 63015	DATA MINING TECHNIQUES	3
CS 63016	BIG DATA ANALYTICS	3
MATH 50015	APPLIED STATISTICS	3
MATH 50024	COMPUTATIONAL STATISTICS	3
MATH 50028	STATISTICAL LEARNING	3
Major Electives, choose from the following:		6
BSCI 60104	BIOLOGICAL STATISTICS	
CS 54201	ARTIFICIAL INTELLIGENCE	
CS 57206	DATA SECURITY AND PRIVACY	
CS 63017	BIG DATA MANAGEMENT	
CS 63018	PROBABILISTIC DATA MANAGEMENT	
CS 63100	COMPUTATIONAL HEALTH INFORMATICS	
CS 64201	ADVANCED ARTIFICIAL INTELLIGENCE	
CS 64402	MULTIMEDIA SYSTEMS AND BIOMETRICS	
CS 67302	INFORMATION VISUALIZATION	
CS 69098	RESEARCH	
or MATH 67098	RESEARCH	
ECON 62054	ECONOMETRICS I	
ECON 62055	ECONOMETRICS II	
ECON 62056	TIME SERIES ANALYSIS	
EHS 52018	ENVIRONMENTAL HEALTH CONCEPTS IN PUBLIC HEALTH	
EPI 52017	FUNDAMENTALS OF PUBLIC HEALTH EPIDEMIOLOGY	
EPI 63016	PRINCIPLES OF EPIDEMIOLOGIC RESEARCH	
EPI 63018	OBSERVATIONAL DESIGNS FOR CLINICAL RESEARCH	
EPI 63019	EXPERIMENTAL DESIGNS FOR CLINICAL RESEARCH	
GEOG 59070	GEOGRAPHIC INFORMATION SCIENCE	
GEOG 59080	ADVANCED GEOGRAPHIC INFORMATION SCIENCE	
HI 60401	HEALTH INFORMATICS MANAGEMENT	
HI 60411	CLINICAL ANALYTICS	
HI 60414	HUMAN FACTORS AND USABILITY IN HEALTH INFORMATICS	
HI 60418	CLINICAL ANALYTICS II	
KM 60301	FOUNDATIONAL PRINCIPLES OF KNOWLEDGE MANAGEMENT	
LIS 60020	INFORMATION ORGANIZATION	
MATH 50011	PROBABILITY THEORY AND APPLICATIONS	
MATH 50051	TOPICS IN PROBABILITY THEORY AND STOCHASTIC PROCESSES	
MATH 50059	STOCHASTIC ACTUARIAL MODELS	
PSYC 61651	QUANTITATIVE STATISTICAL ANALYSIS I	
PSYC 61654	QUANTITATIVE STATISTICAL ANALYSIS II	
Culminating Requirement		
Choose from the following:		6
DATA 69099	CAPSTONE PROJECT	
DATA 69099 & DATA 69192	CAPSTONE PROJECT and GRADUATE INTERNSHIP	
DATA 69199	THESIS I	
Minimum Total Credit Hours:		**30**

Graduation Requirements

The culminating experience requirement is a master's thesis or an integrated learning experience.

The master's thesis requires a written thesis, a public defense of the thesis and approval by the student's supervisory committee. Students must form a master's thesis committee, which will include the advisor and at least two other graduate faculty members. The thesis topic and committee must be approved by the advisor and graduate coordinator. The final version of the thesis must be approved by the advisor, thesis committee and graduate coordinator.

The integrated learning experience may include a substantial capstone project or a capstone project and internship. Students must prepare a written document explaining and/or demonstrating their capstone project or internship activity and its significance. In addition, students must give a public presentation of their capstone project or internship, and the written document and presentation must be approved by their supervisory committee.

Roadmap

This roadmap is a recommended semester-by-semester plan of study for this major. However, courses designated as critical (!) must be completed in the semester listed to ensure a timely graduation.

Semester One		Credits
CS 63005	ADVANCED DATABASE SYSTEMS DESIGN	3
MATH 50015	APPLIED STATISTICS	3
Major Elective		3
	Credit Hours	**9**
Semester Two		
CS 63015	DATA MINING TECHNIQUES	3
MATH 50024	COMPUTATIONAL STATISTICS	3
MATH 50028	STATISTICAL LEARNING	3
	Credit Hours	**9**
Semester Three		
CS 63016	BIG DATA ANALYTICS	3
Major Elective		3
	Credit Hours	**6**

Semester Four	
Culminating Requirement	6
Credit Hours	**6**
Minimum Total Credit Hours:	**30**

Program Learning Outcomes

Graduates of this program will be able to:

1. Ask the questions so that problems in a particular business or industrial situation become clear.
2. Determine if the problem may be addressed with data science methods and tools, and if yes, propose potential methods for solving the problems.
3. Make suggestions for how data science may be used to enhance the quality and value of currently existing products (whether the products are physical or methods) and how data science may be used in the development of new products.

Full Description

The Master of Science degree in Data Science provides a focus on developing scientists who will understand the theories, methods and tools of data science and apply data science to solving research and workplace questions in the natural, health and social sciences for businesses and industries.

Data science is a STEM discipline founded on the principles of mathematics and the sciences and developed through a synthesis of mathematics and computer science. One may think of data science as a blending together of methods and ideas from analysis, statistics, databases, big data, artificial intelligence, numerical analysis, graph theory and visualization for the purposes of finding information in data and applying that information to solving real-world problems.