MASTER OF SCIENCE IN COMPUTER SCIENCE - DATA SCIENCE CONCENTRATION

Department: Computer Science and Information Systems (https://catalog.bradley.edu/graduate/liberal-arts-sciences/computer-science-information-systems/)

The data science concentration provides students with essential background, understanding, knowledge, and tools for discovering knowledge from data. Data science is the confluence of many areas including machine learning, artificial intelligence, information storage and retrieval, statistics and operations research. The courses cover the complete knowledge discovery process and students learn skills such as sampling techniques, data and knowledge representations, cleansing and preprocessing of data sets, machine learning algorithms to build models for forecasting, classification and unsupervised learning tasks, evaluating and comparing models, and combining models through techniques such as boosting and stacking. Big Data, Data Warehousing and OLAP are also covered as well as data and knowledge visualization.

Admissions Requirements

For admission into the computer science program, a student must have the approval of the department and have completed:

1. discrete mathematics
2. at least two semesters of calculus, matrix or linear algebra
3. at least one semester of calculus-based statistics
4. at least 15 hours of computer science coursework including knowledge of one structured or object-oriented programming language, elementary data structures, advanced data structures, and introductory computer architecture

In addition to meeting all the general requirements of Graduate Education and of the department as stated above, candidates for the master's degree in computer science must satisfy the following requirements:

1. At least 21 of the 33 required hours must be earned in courses labeled CS. At most, six hours may be earned in approved courses other than those labeled CS or CIS.
2. To satisfy the core (breadth) requirement, four courses must be taken, one from each pair given below (either by taking the course or showing evidence of the completion of an equivalent course elsewhere):
   - CS 520 Advanced Computer Architecture or CS 625 Operating Systems Design
   - CS 590 Fundamentals of Software Engineering or CS 591 Software Project Management
   - CS 514 Algorithms or CS 612 Automata, Computation and Complexity
   - CS 561 Artificial Intelligence or CS 571 Database Management Systems
3. To satisfy the depth requirements, the student must take three courses from one of the concentrations offered by the department. No course taken to satisfy the core requirement (see item 2) may be counted as one of the three courses in this requirement. Students are admitted into the Master of Science in Computer Science program and declare a concentration after beginning their coursework.

Concentration Requirements

The Concentration consists of 9 semester hours of study including 6 semester hours of required courses and 3 semester hours of elective courses as outlined below.

Code	Title	Hours
Required Courses		
CS 560	Fundamentals of Data Science	3.0
CS 563	Knowledge Discovery and Data Mining	3.0
Elective Courses		**3.0**
Select one of the following:		
CS 561	Artificial Intelligence	
CS 562	Machine Learning	
CS 572	Distributed Databases and Big Data	
Total Hours		**9**