

DATA SCIENCE, BS (COLLEGE OF ENGINEERING AND APPLIED SCIENCE, DEPARTMENT OF COMPUTER SCIENCE)

The Bachelor of Science in Data Science (BSDS) program is a special degree program that blends courses from both the College of Letters & Science and the College of Engineering & Applied Science. It is a structured curriculum offering courses from both statistics and computer science, in addition to electives from other departments and colleges.

The job outlook for individuals with data science degrees is extremely favorable. A student with combined skills in statistical analysis and computer programming is likely to be in high demand on the job market.

Our program is highly technical in nature yet still retains elements of a classic liberal arts degree. Students take courses in the humanities, social sciences, and natural sciences as part of the general education requirements, in addition to mandatory courses on the ethical implications of data science and on writing and communication. A broad world view of cultures, history, and society leads to better decision-making in scientific careers, and strong communication skills make graduates even more attractive in the job market.

Data Science Program Requirements

Students who intend to complete the BS in Data Science (BSDS) program in four years will need to begin taking mathematics in their first semester. Such students should have a University of Wisconsin-Milwaukee mathematics placement level of 30 (ready for precalculus) or better.

Admission

For admission to the BSDS program, students need only meet the general requirements of admission to UW-Milwaukee.

As soon as students realize their interest in the BSDS degree, they should consult with an BSDS advisor either in the College of Engineering and Applied Science or College of Letters and Science, who will assist in planning a program.

Degree Requirements

The program requires at least 120 credits, which include University-wide General Education Requirements (<https://catalog.uwm.edu/policies/undergraduate-policies/#bachelorsdegreegeneraleducation>), 23-28 credits of mandatory preparatory courses, 36 credits of mandatory advanced core courses, a capstone course or an internship at the end of the coursework, and additional elective courses to fulfill the overall credit requirement.

An average GPA of 2.000 on all coursework attempted at UWM is required for this degree. In addition, students must achieve an average 2.000 GPA on all coursework attempted, including transfer work. A minimum 2.000 GPA must be earned, on average, on 300-level and above courses taken to satisfy the advanced requirements. Students satisfy the residency requirement for the degree by completing at UWM both a minimum of 15

credits of the required advanced courses in the major and a minimum of 30 credits overall.

Code	Title	Credits
Preparatory Courses		
<i>Mathematics</i>		
One of the following calculus sequences (or an equivalent) ¹		8-12
MATH 231 & MATH 232 & MATH 233	Calculus and Analytic Geometry I and Calculus and Analytic Geometry II and Calculus and Analytic Geometry III	
MATH 211 & MATH 212	Survey in Calculus and Analytic Geometry I and Survey in Calculus and Analytic Geometry II	
MATH 234 or MATH 240	Linear Algebra and Differential Equations Matrices and Applications	3-4
<i>Computer Science</i>		
COMPSCI 250	Introductory Computer Programming	4
COMPSCI 251	Intermediate Computer Programming	4
<i>Statistics</i>		
MTHSTAT 215 or IND ENG 367	Elementary Statistical Analysis Engineering Statistics	3
MTHSTAT 216	Introduction to Statistical Computing and Data Science	3
Total Credits		25-30

¹ One equivalent sequence accepted is MATH 221 & MATH 222, or a student may replace MATH 211 or MATH 231 with MATH 213 (for other combinations see advisor).

Code	Title	Credits
Core Courses		
<i>Statistics</i>		
MTHSTAT 361	Introduction to Mathematical Statistics I	3
MTHSTAT 362	Introduction to Mathematical Statistics II	3
MTHSTAT 563	Regression Analysis	3
MTHSTAT 566	Computational Statistics	3
MTHSTAT 568	Multivariate Statistical Analysis	3
<i>Computer Science</i>		
COMPSCI 317 or MATH 341	Discrete Information Structures Seminar: Introduction to the Language and Practice of Mathematics	3
COMPSCI 351	Data Structures and Algorithms	4
COMPSCI 395 or PHILOS 237	Social, Professional, and Ethical Issues Technology, Values, and Society	3
COMPSCI 422	Introduction to Artificial Intelligence	3
COMPSCI 411 or COMPSCI 425	Machine Learning and Applications Introduction to Data Mining	3
COMPSCI 557	Introduction to Database Systems	3
<i>Communication and Ethics</i>		

ENGLISH 310	Writing, Speaking, and Technoscience in the 21st Century	3
Total Credits		37

Code	Title	Credits
------	-------	---------

Capstone Experience (select one of the options below)

MTHSTAT 489	Internship in Mathematical Statistics, Upper Division	1-6
MATH 599	Capstone Experience	1
COMPSCI 595	Capstone Project	3
COMPSCI 599	Senior Thesis	3

Code	Title	Credits
------	-------	---------

Electives (to reach 120 total credits)

Suggested are courses with substantial data analysis, data processing, or computational content, such as:

COMPSCI 315	Introduction to Computer Organization and Assembly Language Programming	3
COMPSCI 411	Machine Learning and Applications	3
COMPSCI 423	Introduction to Natural Language Processing	3
COMPSCI 425	Introduction to Data Mining	3
COMPSCI 444	Introduction to Text Retrieval and Its Applications in Biomedicine	3
COMPSCI 459	Fundamentals of Computer Graphics	3
COMPSCI 469	Introduction to Computer Security	3
COMPSCI 535	Algorithm Design and Analysis	3
MTHSTAT 562	Design of Experiments	3
MTHSTAT 564	Time Series Analysis	3
MTHSTAT 565	Nonparametric Statistics	3
MATH 315	Mathematical Programming and Optimization	3
MATH 318	Topics in Discrete Mathematics	3
MATH 583	Introduction to Probability Models	3
INFOST 120	Information Technology Ethics	3
INFOST 315	Knowledge Organization for Information Science and Technology	3
INFOST 465	Legal Aspects of Information Products and Services	3
INFOST 660	Information Policy	3
INFOST 661	Information Ethics	3

College of Engineering and Applied Science Dean's Honor List

GPA of 3.500 or above, earned on a full-time student's GPA on 12 or more graded credits in a given semester.

Honors College Degree and Honors College Degree with Distinction

Granted to graduating seniors who complete Honors College requirements, as listed in the Honors College (<https://catalog.uwm.edu/honors-college/>) section of this site.

Commencement Honors

Students with a cumulative GPA of 3.500 or above, based on a minimum of 40 graded UWM credits earned prior to the final semester, will receive all-university commencement honors and be awarded the traditional gold cord at the December or May Honors Convocation. Please note that for honors calculation, the GPA is **not** rounded and is truncated at the third decimal (e.g., 3.499).

Final Honors

Earned on a minimum of 60 graded UWM credits: Cum Laude - 3.500 or above; Magna Cum Laude - 3.650 or above; Summa Cum Laude - 3.800 or above.

Data Science BS Learning Outcomes

Students graduating from this program will be able to:

1. **integrate** methods and concepts from mathematics, statistics and computer science to solve data science problems, including data management and extraction of meaning from data.
2. **apply** critical thinking skills to data science problems and concepts.
3. **communicate** data science content effectively, in oral and written ways.
4. **reflect** on the ethical aspects of data science.