Master of Science in Data Science

The University of Wisconsin - Green Bay, the University of Wisconsin – Eau Claire, the University of Wisconsin - La Crosse, the University of Wisconsin – Oshkosh, the University of Wisconsin – Stevens Point, and the University of Wisconsin – Superior in collaboration with the University of Wisconsin – Extension are offering a Master's of Science in Data Science. This master's program is entirely online and will teach you how to harness the power of big data using the latest tools and analytical methods. The program focuses on how to clean, organize, analyze, and interpret structured and unstructured data, deriving knowledge and communicating your discoveries clearly to stakeholders. It is a 12-course, 36 credit program and is taught by expert faculty.

This program will prepare you to how to realize value from big data and make better decisions. The insight gained could help organizations public, private or non-profit in enhancing customer engagement, optimizing operations, identifying and preventing fraud, and generating new sources of revenue among others. The program offerings are relevant for virtually any industry- health care, retail, marketing, manufacturing, transportation, communication, education, insurance, finance, security, law enforcement, and more.

Code	Title	Credits
Core Curriculum		
DS 700	Foundations of Data Science	3
DS 705	Statistical Methods	3
DS 710	Programming for Data Science	3
DS 715	Data Warehousing	3
DS 730	Big Data: High-Performance Computing	3
DS 735	Communicating About Data	3
DS 740	Data Mining	3
DS 745	Visualization and Unstructured Data Analysis	3
DS 760	Ethics of Data Science	3
DS 775	Prescriptive Analytics	3
DS 780	Data Science and Strategic Decision Making	3
DS 785	Capstone	3
Total Credits		36

Courses

DS 700. Foundations of Data Science. 3 Credits.
This course provides an introduction to data science and highlights its importance in business decision making. It provides overview of commonly used data science tools along with spreadsheet, database, statistics and programming assignments to lay the foundation for data science applications.
Fall and Spring.

DS 705. Statistical Methods. 3 Credits.
Statistical methods and inference procedures will be presented in this course with an emphasis on applications, computer implementation, and interpretation of results. Topics include simple and multiple regression, model selection, correlation, moderation/interaction analysis, logistic regression, chi-square test, ANOVA, Kruskal-Wallis test, MANOVA, factor analysis, and canonical correlation analysis.
Fall and Spring.

DS 710. Programming for Data Science. 3 Credits.
Introduction to programming languages and packages used in Data Science.
Fall and Spring.

DS 715. Data Warehousing. 3 Credits.
Introduces the concepts and techniques to work with and reason about subject-oriented, integrated, time-variant, and nonvolatile collections of data in support of management's decision-making process.
Fall and Spring.

DS 730. Big Data: High-Performance Computing. 3 Credits.
This course will teach students how to process large datasets efficiently. Students will be introduced to non-relational databases. Students will learn algorithms that allow for the distributed processing of large data sets across clusters.
P: DS 710
Fall and Spring.

DS 735. Communicating About Data. 3 Credits.
This course will prepare you to master technical, informational and persuasive communication to meet organizational goals. Technical communication topics include a study of the nature, structure and interpretation of data. Informational communication topics include data visualization and design of data for understanding and action. Persuasive communication topics include the study of written, verbal and nonverbal approaches to influencing decision makers.
Fall and Spring.

DS 740. Data Mining. 3 Credits.
Data mining methods and procedures for diagnostic and predictive analytics. Topics include association rules, clustering algorithms, tools for classification, and ensemble methods. Computer implementation and applications will be emphasized.
P: DS 705, DS 710
Fall and Spring.

DS 745. Visualization and Unstructured Data Analysis. 3 Credits.
This course covers two aspects of data analytics. First, it teaches techniques to generate visualizations appropriate to the audience type, task, and data. Second, it teaches methods and techniques for analyzing unstructured data – including text mining, web text mining and social network analysis.
P: DS 700, DS 705, DS 710, DS 740
Fall and Spring.

DS 760. Ethics of Data Science. 3 Credits.
This course explores ethical issues related to data science, including privacy, intellectual property, security, and the moral integrity of inferences based on data.
P: DS 700 or DS 780
Fall and Spring.

DS 775. Prescriptive Analytics. 3 Credits.
This course covers procedures and techniques for using data to inform the decision-making process. Topics include optimization, decision analysis, game theory, simulation, and others as time allows. Case studies and applications will be emphasized.
P: DS 705
Fall and Spring.

DS 780. Data Science and Strategic Decision Making. 3 Credits.
The course will investigate the use of data science findings to develop solutions to competitive business challenges. Case studies will be reviewed to examine how data science methods can support business decision-making. A range of methods the data scientist can use to get people within the organization onboard with data science projects will be reviewed.
Fall and Spring.

DS 785. Capstone. 3 Credits.
Capstone course in which students will develop and execute a project involving real-world data. Projects will include: formulation of a question to be answered by the data; collection, cleaning and processing of data; choosing and applying a suitable model and/or analytic method to the problem; and communicating the results to a non-technical audience.
P: DS700, DS705, DS710, DS715, DS730, DS735, DS740, DS745, DS775
Fall and Spring.