



Program Guidebook

Master of Science, Data Analytics - Data Science

The MS Data Analytics degree prepares a diverse range of professionals for thriving careers in the dynamic field of data analytics. By arming graduates with the competencies needed to tackle business challenges through data mining, predictive analysis, analytics deployment, and compelling data storytelling techniques, the MSDA ensures they are well-prepared for success. Emphasizing both theory and practical application, the curriculum fosters the development of skills necessary to drive impactful change within organizations spanning various industries and sectors. The Data Science concentration enhances mastery in statistical and programming methodologies, delving into the advanced topics advanced analytics professionals will need such as machine learning, neural networks, and numerical optimization. The program includes a concentration-specific capstone, providing an opportunity for students to showcase their skills in a comprehensive manner.

Understanding the Competency-Based Approach

Practically speaking, how do competency-based programs like those offered at Western Governors University (WGU) work? Unlike traditional universities, WGU does not award degrees based on completion of a certain number of credit hours or a certain set of required courses. Instead, you will earn your degree by demonstrating your skills, knowledge, and understanding of important concepts.

Progress through a degree program is governed not by the amount of time you spend in class but by your ability to demonstrate mastery of competencies as you complete required courses. Of course, you will need to engage in learning experiences as you review competencies or develop knowledge and skills in areas in which you may be weak. To help you acquire the knowledge and skills you need to complete your courses and program, WGU provides a rich array of learning resources. Your program mentor will work closely with you to help you understand the competencies required for your program and to help you create a schedule for completing your courses. You will also work closely with course instructors as you engage in each of your courses. As subject matter experts, course instructors will guide you through the content you must master to pass the course assessments.

The benefit of this competency-based system is that it enables students who are knowledgeable about a particular subject to make accelerated progress toward completing a degree, even if they lack college experience. You may have gained skills and knowledge of a subject while on the job, accumulated wisdom through years of life experience, or already taken a course on a particular subject. WGU will award your degree based on the skills and knowledge that you possess and can demonstrate—not the number of credits hours on your transcript.

Accreditation

Western Governors University is the only university in the history of American higher education to have earned accreditation from four regional accrediting commissions. WGU's accreditation was awarded by (1) the Northwest Commission on Colleges and Universities, (2) the Higher Learning Commission of the North Central Association of Colleges and Schools, (3) the Accrediting Commission for Community and Junior Colleges of the 75 -347.tsvn deeior 0 0 at 0 at 0'a7eror Community and

as 15–20 hours per week to the program, while others may need to devote more time. For this reason, pre-assessments are there to help your program mentor form a profile of your prior knowledge and create a personalized Degree Plan.

How You Will Interact with Faculty

At WGU, faculty serve in specialized roles, and they will work with you individually to provide the guidance, instruction, and support you will need to succeed and graduate. As a student, it is important for you to take advantage of this support. It is key to your progress and ultimate success.

Upon your enrollment, you will be assigned a program mentor—an expert in your field of study who will provide you with regular program-level guidance and support from the day you start until the day you graduate. Your program mentor will set up regular telephone appointments (weekly at first) with you, which you will be expected to keep. The mentor will review program competencies with you and work with you to develop a plan and schedule for your coursework. Your program mentor will serve as your main point of contact throughout your program—helping you set weekly study goals, recommending specific learning materials, telling you what to expect in courses, and keeping you motivated. In addition to regular calls, your program mentor is available to help you resolve questions and concerns as they arise.

You will also be assigned to a course instructor for each course. Course instructors are subject matter experts who will assist your learning in each individual course. When you begin a new course, your assigned course instructor will actively monitor your progress and will be in touch to offer one-on-one instruction and to provide you with information about webinars, cohort sessions, and other learning opportunities available to help you acquire the competencies you need to master the course. Your course instructor can discuss your learning for the course, help you find answers to content questions, and give you the tools to navigate the course successfully. In addition, you will communicate with course instructors by posting in the online learning community and participating in live discussion sessions such as webinars and cohorts.

For many of the courses at WGU, you will be required to complete performance assessments. These include reports, papers, presentations, and projects that let you demonstrate your mastery of the required competencies. A separate group of faculty members, called evaluators, will review your work to determine whether it meets requirements. Evaluators are also subject matter experts in their field of evaluation. If your assessment needs further work before it “meets competency,” these evaluators, who review your work anonymously, will provide you with evaluation feedback to help you demonstrate competency and allow you to advance.

Connecting with Other Mentors and Fellow Students

As you proceed through your Degree Plan, you will have direct contact with multiple faculty members. These communications can take a variety of forms, including participation in one-on-one discussions, chats in the learning communities, and live cohort and webinar opportunities. As a WGU student, you will have access to your own personal MyWGU Student Portal, which will provide a gateway to your courses of study, learning resources, and learning communities where you will interact with faculty and other students.

The learning resources in each course are specifically designed to support you as you develop competencies in preparation for your assessments. These learning resources may include reading materials, videos, tutorials, cohort opportunities, community discussions, and live discussions that are guided by course instructors who are experts in their field. You will access your program community during your orientation course to network with peers who are enrolled in your program and to receive continued support through professional enrichment and program-specific chats, blogs, and discussions. WGU also provides Student Services associates to help you and your program mentor solve any special problems that may arise.

Orientation

The WGU orientation course focuses on acquainting you with WGU's competency-based model, distance education, technology, and other resources and tools available for students. You will also utilize WGU program and course communities, participate in activities, and get to know other students at WGU. The orientation course must be completed before you can start your first term at WGU.

Transferability of Prior College Coursework

Because WGU is a competency-based institution, it does not award degrees based on credits but rather on demonstration of competency. However, if you have completed college coursework at another

Standard Path for Master of Science, Data Analytics - Data Science

Course Description	CUs	Term
The Data Analytics Journey	2	1
Data Management	3	1
Analytics Programming	3	1
Data Preparation and Exploration	3	2
Statistical Data Mining	3	2
Data Storytelling for Diverse Audiences	3	2
Deployment	3	3
Machine Learning	3	3
Advanced Analytics	3	3
Optimization	3	4
Data Science Capstone	3	4

Changes to Curriculum

WGU publishes an Institutional Catalog, which describes the academic requirements of each degree program. Although students are required to complete the program version current at the time of their enrollment, WGU may modify requirements and course offerings within that version of the program to maintain the currency and relevance of WGU's competencies and programs. When program requirements are updated, students readmitting after withdrawal from the university will be expected to re-enter into the most current catalog version of the program.

Areas of Study for **Master of Science, Data Analytics - Data Science**

The following section includes the areas of study in the program, with their associated courses. Your specific learning resources and level of instructional support will vary based on the individual competencies you bring to the program and your confidence in developing the knowledge, skills, and abilities required in each area of the degree. The Degree Plan and learning resources are dynamic, so you need to review your Degree Plan and seek the advice of your mentor regarding the resources before you purchase them.

The learner integrates programming language syntax, control elements, and modular components from common data analytics programming languages to create simple programs.

The learner performs data acquisition and organization tasks using a data analytics programming language.

Data Preparation and Exploration

Data Preparation and Exploration applies analytical programming skills to the early steps of the data analytics life cycle. This course covers cleaning data to ensure the structure, accuracy, and quality of the data; interpretation of descriptive and inferential statistics as well as visualizations of data; and wrangling data to prepare it for further analysis. The course introduces hypothesis testing, focusing on application for parametric tests, and addresses communication skills and tools to explain an analyst's findings to others within an organization. The following courses are prerequisites: The Data Analytics Journey, Data Management, and Analytics Programming.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The learner interprets a data dictionary to understand the data set.

The learner interprets probability, descriptive and inferential statistics, and visualization.

The learner wrangles data to ensure accuracy, format, and integrity relevant to the task being performed.

Statistical Data Mining

Statistical Data Mining focuses on concepts in data preparation and supervised and unsupervised machine learning techniques. The course helps students gain basic knowledge in statistics, data preparation, regression, and dimensional

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The learner analyzes a business case to determine the requirements necessary for deployment.

The learner implements a data product pipeline to address organizational needs.

The learner implements a function to call and receive information between multiple systems for deployment.

The learner deploys a data product based on project requirements.

Data Science

Machine Learning

Machine Learning is the broad discipline of developing algorithms and statistical models to predict, classify, or cluster data and that iteratively improve over time. Machine Learning focuses on building, training, running, and testing supervised and unsupervised models and quantifying the accuracy and precision of those models to determine which may best be used in a particular business situation. Supervised methods covered include k-nearest neighbors, logistic regression, decision trees, and support vector machines. Unsupervised models covered include k-means clustering, hierarchical clustering, and t-distributed stochastic neighbor embedding (t-SNE). Ensemble methods are also presented. Prerequisites are Analytics Programming and Statistical Data Mining.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The learner recommends a supervised machine learning model based on a comparison of model performance given a business problem.

The learner recommends an unsupervised machine learning model based on a comparison of model performance given a business problem.

The learner applies time series models in generating forecasts.

Advanced Analytics

Advanced Analytics extends analytics techniques from machine learning to artificial intelligence more broadly, including topics in neural networks, deep learning, and natural language processing. The course covers approaches to developing these models including PyTorch and TensorFlow. Students learn to apply a combination of techniques to solve complex business challenges including computer vision and sentiment analysis.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The learner applies neural networks to solve a business problem.

The learner applies natural language processing to solve a business problem.

Optimization

Optimization is a large class of business problems requiring the iterative algorithmic maximization or minimization of one or more variables. Students in this course will select and use a variety of optimization approaches to address various business needs. The course covers classes of optimization problems at a foundational level (continuous/discrete, linear/nonlinear, and bounded/unbounded) and the solving of linear optimization problems in both Python and R through the use of gradient and non-gradient-based algorithms. Analytics Programming is a prerequisite.

This course covers the following competencies:

Begin your course by discussing your course planning tool report with your instructor and creating your personalized course plan together.

The learner analyzes a business case to recommend a particular optimization approach.

The learner identifies the objective function and constraints for an optimization problem.

The learner solves an optimization problem programmatically.

Accessibility and Accommodations

Western Governors University is committed to providing equal access to its academic programs to all qualified students. WGU's Accessibility Services team supports this mission by providing support, resources, advocacy, collaboration, and academic accommodations for students with disabilities and other qualifying conditions under the Americans with Disabilities Act (ADA). WGU encourages student to complete the Accommodation Request Form as soon as they become aware of the need for an accommodation. Current and prospective students can reach the Accessibility Services team Monday through Friday 8:00 a.m. to 5:00 p.m. MST at 1-877-HELP-WGU (877-435-7948) x5922 or at ADASupport@wgu.edu.

Need More Information? WGU Student Services

WGU's Student Services team is dedicated exclusively to helping you achieve your academic goals. The Student Services office is available during extended hours to assist with general questions and requests. The Student Services team members help you resolve issues, listen to student issues and concerns, and make recommendations for improving policy and practice based on student feedback.

Student Services team members also assist with unresolved concerns to find equitable resolutions. To contact the Student Services team, please feel free to call 877-435-7948 or e-mail studentservices@wgu.edu. We are available Monday through Friday from 6:00 a.m. to 10:00 p.m., Saturday from 7:00 a.m. to 7:00 p.m., mountain standard time. Closed Sundays.

If you have inquiries or concerns that require technical support, please contact the WGU IT Service Desk. The IT Service Desk is available Monday through Friday, 6:00 a.m. to 10:00 p.m. and Saturday and Sunday, 10:00 a.m. to 7:00 p.m., mountain standard time. To contact the IT Service Desk, please call 1-877-HELP-WGU (877-435-7948) or e-mail servicedesk@wgu.edu. The support teams are generally closed in observance of university holidays.

For the most current information regarding WGU support services, please visit "Student Support" on the Student Portal at <http://my.wgu.edu>.