WESTERN GOVERNORS UNIVERSITY

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Program Guidebook

Bachelor of Science, Data Management/Data Analytics

The B.S. in Data Management/Data Analytics is designed to prepare science professionals who can set up a database environment, design databases, acquire data, wrangle it, analyze it, and visualize it to different audiences as part of the decision-making process

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 Western Association of Schools and Colleges, and (4) the Accrediting Commission for Senior Colleges and Universities of the Western Association of Schools and Colleges. The university's accreditation status is now managed by the Northwest Commission on Colleges and Universities (NWCCU), which reaffirmed WGU's accreditation in February 2020. The WGU Teachers College is accredited at the initial-licensure level by the Council for the Accreditation of Educator Preparation (CAEP) and by the Association for Advancing Quality in Educator Preparation (AAQEP). The nursing programs are accredited by the Commission on Collegiate Nursing Education (CCNE). The Health Information Management program is accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM). The College of Business programs are accredited by the Accreditation Council for Business Schools and Programs (ACBSP).

The Degree Plan

The focus of your program is your personalized Degree Plan. The Degree Plan is a detailed blueprint of the courses you will need to complete in order to earn your degree. The Degree Plan also lays out the accompanying learning resources and assessments that compose your program. The list of courses in the Degree Plan is often referred to as the standard path. The amount of time it takes to complete your program depends on both the amount of new information you need to learn and the amount of time you plan to devote each week to study. Your program mentor and course instructors will help you assess your strengths and development needs to establish a study plan.

Students vary widely in the specific skills and information they need to learn. For example, some students may be highly knowledgeable in a particular subject matter and would not need to engage in new learning opportunities. Other students may find that portions of the program require them to learn new information and that they need to take an online class or participate in a study module to acquire the knowledge and skills needed to fulfill program competencies in that area. Some individuals may be able to devote as little

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 accredited institution, or if you have completed industry certifications, you may have your transcripts and certifications evaluated to determine if you are eligible to receive some transfer credit. The guidelines for determining what credits will be granted varies based on the degree program. Students entering graduate programs must have their undergraduate degree verified before being admitted to WGU. To review more information in regards to transfer guidelines based on the different degree programs, you may visit the Student Handbook found at the link below and search for "Transfer Credit Evaluation."

[Click here for the Student Handbook](#)

WGU does not waive any requirements based on a student's professional experience and does not perform a "résumé review" or "portfolio review" that will automatically waive any degree requirements. Degree requirements and transferability rules are subject to change in order to keep the degree content relevant and current.

Remember, WGU's competency-based approach lets you take advantage of your knowledge and skills, regardless of how you obtained them. Even when you do not directly receive credit, the knowledge you possess may help you accelerate the time it takes to complete your degree program.

Continuous Enrollment, On Time Progress, and Satisfactory Academic Progress

WGU is a "continuous enrollment" institution, which means you will be automatically enrolled in each of your new terms while you are at WGU. Each term is six months long. Longer terms and continuous enrollment allow you to focus on your studies without the hassle of unnatural breaks between terms that you would experience at a more traditional university. At the end of every six-month term, you and your program mentor will review the progress you have made and revise your Degree Plan for your next six-month term.

WGU requires that students make measurable progress toward the completion of their degree programs every term. We call this "On-Time Progress," denoting that you are on track and making progress toward on-time graduation. As full-time students, graduate students must enroll in at least 8 competency units each term, and undergraduate students must enroll in at least 12 competency units each term. Completing at least these minimum enrollments is essential to On-Time Progress and serves as a baseline from which you may accelerate your program. We measure your progress based on the courses you are able to pass, not on your accumulation of credit hours or course grades. Every time you pass a course, you are demonstrating that you have mastered skills and knowledge in your degree program. For comparison to traditional grading systems, passing a course means you have demonstrated competency equivalent to a "B" grade or better.

WGU assigns competency units to each course in order to track your progress through the program. A competency unit is equivalent to one semester credit of learning. Some courses may be assigned 3 competency units while others may be as large as 12 competency units.

Satisfactory Academic Progress (SAP) is particularly important to students on financial aid because you must achieve SAP in order to maintain eligibility for financial aid. We will measure your SAP quantitatively by reviewing the number of competency units you have completed each term. In order to remain in good

academic standing, you must complete at least 66.67% of the units you attempt over the length of your program—including any courses you add to your term to accelerate your progress. Additionally, during your first term at WGU you must pass at least 3 competency units in order to remain eligible for financial aid. We know that SAP is complex, so please contact a financial aid counselor should you have additional questions. *Please note: The Endorsement Preparation Program in Educational Leadership is not eligible for federal financial aid.

Courses

Your Degree Plan includes courses needed to complete your program. To obtain your degree, you will be required to demonstrate your skills and knowledge by completing the assessment(s) for each course. In general there are two types of assessments: performance assessments and objective assessments. Performance assessments contain, in most cases, multiple scored tasks such as projects, essays, and research papers. Objective assessments include multiple-choice items, multiple-selection items, matching, short answer, drag-and-drop, and point-and-click item types, as well as case study and video-based items. Certifications verified through third parties may also be included in your program. More detailed information about each assessment is provided in each course of study.

Learning Resources

WGU works with many different educational partners, including enterprises, publishers, training companies, and higher educational institutions, to provide high-quality and effective learning resources that match the competencies you are developing. These vary in type, and may be combined to create the best learning experience for your course. A learning resource can be an e-textbook, online module, study guide, simulation, virtual lab, tutorial, or a combination of these. The cost of most learning resources are included in your tuition and Learning Resource Fee. They can be accessed or enrolled for through your courses. Some degree-specific resources are not covered by your tuition, and you will need to cover those costs separately. WGU also provides a robust library to help you obtain additional learning resources, as needed.

Mobile Compatibility:

The following article provides additional details about the current state of mobile compatibility for learning resources at WGU. It includes a list that can be referenced to determine the mobile friendliness of all core course materials used in a program.

 [Student Handbook article: Can I use my mobile device for learning resources?](#)

Standard Path

As previously mentioned, competency units (CUs) have been assigned to each course in order to measure your academic progress. If you are an undergraduate student, you will be expected to enroll in a minimum of 12 competency units each term. Graduate students are expected to enroll in a minimum of 8 competency units each term. A standard plan for a student for this program who entered WGU without any transfer units would look similar to the one on the following page. Your personal progress can be faster, but your pace will be determined by the extent of your transfer units, your time commitment, and your determination to proceed at a faster rate.

Standard Path *for* Bachelor of Science, Data Management/Data Analytics

Course Description	CUs	Term
Introduction to IT	4	1
Introduction to Communication: Connecting with Others	3	1
Scripting and Programming - Foundations	3	1
Data Management - Foundations	3	1
Composition: Writing with a Strategy	3	2
Network and Security - Foundations	3	2
Data Management - Applications	4	2
IT Foundations	4	2
American Politics and the US Constitution	3	3
IT Applications	4	3
Introduction to Programming in Python	3	3
Applied Probability and Statistics	3	3
Introduction to Spreadsheets	1	4
Version Control	1	4
Introduction to Geography	3	4
Applied Algebra	3	4
IT Leadership Foundations	3	4
Web Development Foundations	3	4
Introduction to Humanities	3	5
Scripting and Programming - Applications	4	5
Technical Communication	3	5
Natural Science Lab	2	5
Integrated Physical Sciences	3	6
Ethics in Technology	3	6
Networks	4	6
Business of IT - Project Management	4	6
Advanced Data Management	3	7
Business of IT - Applications	4	7
Data Analytics	4	7
Critical Thinking: Reason and Evidence	3	7
Introduction to Data Science	4	8
Data Wrangling	3	8
Data Analysis with R	2	8
Machine Learning	3	8
Data Visualization	2	9

Course Description	CUs	Term
Data Systems Administration	3	9
Data and Information Governance	2	9
Data Structures and Algorithms I	4	9
Data Management/Analytics Undergraduate Capstone	4	9

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 Bachelor of Science, Data Management/Data Analytics

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.

IT Fundamentals

Introduction to IT

Introduction to IT examines information technology as a discipline and the various roles and functions of the IT department as business support. Students are presented with various IT disciplines including systems and services, network and security, scripting and programming, data management, and business of IT, with a survey of technologies in every area and how they relate to each other and to the business.

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 graduate describes IT as a discipline and discusses the history and future of computing as well as the currently used infrastructure.*

- *The graduate describes information technology systems and their role in converting data to organizational knowledge.*

- *The graduate identifies the role of different types of software in a computing environment and explains the fundamentals of software development.*

- *The graduate recognizes and describes functions of basic computer hardware components.*

- *The graduate describes the structure, function, and security associated with networks.*

- *The graduate identifies common software architectures, development techniques, and the relationship between software and its environment.*

- *The graduate explains the structure and function of databases.*

- *The graduate explains the role of technology in today's business environment and describes basic concepts of project management.*

- *The graduate evaluates ethical concerns involved in the use of technology.*

IT Foundations

IT Foundations is the first course in a two-part series that will prepare you for the CompTIA A+ exam, Part I. This course focuses mostly on hardware and will afford you the skills you need to support five core components: Mobile Devices; Networking; Hardware; Virtualization and Cloud Computing; and Network and Hardware Troubleshooting. These are essential skills to set up and troubleshoot any system. Whether you work in a data center or an office, most of your work as an IT professional will execute in a hardware platform; understanding the hardware layer of the IT infrastructure will allow you to work more efficiently, provide solutions for business requirements, and be a key contributor in your company.

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 graduate configures client-side virtualization to meet organizational requirements.*

- *The graduate determines appropriate diagnostic and repair strategies for common personal computer hardware, access to network resources, and network connectivity.*

- *The graduate recommends appropriate strategies for classifying, installing, configuring, optimizing, upgrading, and troubleshooting laptops and mobile devices.*

- *The graduate recommends appropriate strategies for classifying, installing, configuring, optimizing, and upgrading basic network types.*

- *The graduate demonstrates an understanding of personal computer components and their function in a desktop system.*

IT Applications

IT Applications explores personal computer components and their functions in a desktop system. Topics cover computer data storage and retrieval, including classifying, installing, configuring, optimizing, upgrading, and troubleshooting printers, laptops, portable devices, operating systems, networks, and system security. Other areas in this course include recommending appropriate tools, diagnostic procedures, preventive maintenance, and troubleshooting techniques for personal computer components in a desktop system. The course then finishes with strategies for identifying, preventing, and reporting safety hazards in a technological environment; effective communication with colleagues and clients; and job-related professional behavior. This course is designed to build the skills to support four core components: operating systems, security, software troubleshooting, and operational procedures. These are core competencies for IT professionals from cloud engineers to data analysts, and these competencies will empower students with a better understanding of the tools used during their careers.

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 graduate determines appropriate tools, diagnostic procedures, preventive maintenance, security, malware removal, and troubleshooting techniques for common personal computer and mobile operating systems (mobile and personal computer) and applications.*

- *The graduate determines appropriate strategies to implement documentation, change management, and disaster recovery; explain common safety and environmental concerns; explain addressing prohibited content; and use professional communication techniques.*

- *The graduate determines appropriate strategies for classifying, installing, configuring, optimizing, upgrading, and troubleshooting computer operating systems.*

- *The graduate determines appropriate strategies for classifying, controlling access to, setting permission for, configuring, optimizing, and upgrading basic system security.*

Introduction to Spreadsheets

The Introduction to Spreadsheets course will help students become proficient in using spreadsheets to analyze business problems. Students will demonstrate competency in spreadsheet development and analysis for business applications (e.g., using essential spreadsheet functions, formulas, tables, charts, etc.). Introduction to Spreadsheets has no prerequisites.

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 graduate creates formatted spreadsheets, using appropriate functions to organize and present data effectively.*

- *The graduate applies appropriate formulas and functions to aggregate and summarize spreadsheet data.*

- *The graduate creates tables to summarize and analyze data to make decisions.*

- *The graduate creates data visualizations using charts and graphs for use in a professional setting.*

General Education

Introduction to Communication: Connecting with Others

Welcome to Introduction to Communication: Connecting with Others! It may seem like common knowledge that communication skills are important, and that communicating with others is inescapable in our everyday lives. While this may appear simplistic, the study of communication is actually complex, dynamic, and multifaceted. Strong communication skills are invaluable to strengthening a multitude of aspects of life. Specifically, this course will focus on communication in the professional setting, and present material from multiple vantage points, including communicating with others in a variety of contexts, across situations, and with diverse populations. Upon completion, you will have a deeper understanding of both your own and others' communication behaviors, and a toolbox of effective behaviors to enhance your experience in the workplace.

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 implements appropriate communication styles based on audience and setting.*
- *The learner uses communication strategies for managing conflict.*
- *The learner uses communication strategies to influence others.*

Composition: Writing with a Strategy

Welcome to Composition I: Writing with a Strategy! In this course, you will focus on three main topics: writing strategies, writing style, format and grammar, and editing and revising text. This course consists of an introduction and five sections aligned to the three main topics. The sections address understanding purpose and audience, writing strategies and techniques, format, style, structure, and grammar, editing and revision strategies, and constructive feedback. Each section includes learning opportunities through readings, videos, audio, and other relevant resources. Assessment activities with feedback also provide opportunities to check your learning, practice, and show how well you understand course content. Because the course is self-paced, you may move through the material as quickly or as slowly as you need to gain proficiency in the five competencies that will be covered in the final assessment. If you have no prior knowledge or experience, you can expect to spend 30-40 hours on the course content.

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 individual writes with purpose for a given context and target audience.*
- *The individual incorporates writing strategies and techniques for written communication.*
- *The individual constructs a written document with correct format, style, structure, and grammar.*
- *The individual formulates a strategy for editing and revising written text*
- *The individual composes constructive feedback of written texts.*

American Politics and the US Constitution

American Politics and the U.S. Constitution examines the evolution of representative government in the United States and the changing interpretations of the civil rights and civil liberties protected by the Constitution. This course will give candidates an understanding of the powers of the branches of the federal government, the continual tensions inherent in a federal system, the shifting relationship between state and federal governments, and the interactions between elected officials and the ever-changing electorate. This course will focus on such topics as the role of a free press in a democracy, the impact of changing demographics on American politics, and the debates over and expansion of civil rights. Upon completion of the course, candidates should be able to explain the basic functions of the federal government, describe the forces that shape American policy and politics, and be better prepared to participate in America's civic institutions. This course has no 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 graduate describes the influence of competing political ideologies on the development of the United States government.*
- *The graduate explains how the structure and powers of the United States government interact to form public policy.*
- *The graduate examines the influence of political parties, citizens, and non-governmental organizations on elections and other political processes inside a participatory democracy.*
- *The graduate examines the struggle to balance individual liberty, public order, and state's rights.*
- *The graduate examines the influence of the media, public opinion, and political discourse on American democracy.*

Applied Probability and Statistics

Applied Probability and Statistics is designed to help students develop competence in the fundamental concepts of basic statistics including: introductory algebra and graphing; descriptive statistics; regression and correlation; and probability. Statistical data and probability are often used in everyday life, science, business, information technology, and educational settings to make informed decisions about the validity of studies and the effect of data on decisions. This course discusses what constitutes sound research design and how to appropriately model phenomena using statistical data. Additionally, the content covers simple probability calculations, based on events that occur in the business and IT industries. No

prerequisites are required for this course.

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 graduate applies the operations, processes, and procedures of fractions, decimals, and percentages to evaluate quantitative expressions.*
- *The graduate applies the operations, processes, and procedures of basic algebra to evaluate quantitative expressions, and to solve equations and inequalities.*
- *The graduate evaluates categorical and quantitative data pertaining to a single variable using appropriate graphical displays and numerical measures.*
- *The graduate evaluates the relationship between two variables through interpretation of visual displays and numerical measures.*
- *The graduate evaluates the relationship between two quantitative variables through correlation and regression.*
- *The graduate applies principles and methods of probability-based mathematics to explain and solve problems.*

Introduction to Geography

This course will discuss geographic concepts, places and regions, physical and human systems, and the environment.

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 graduate can describe and discuss fundamental concepts in geography.*
- *The graduate can describe and discuss places and regions.*
- *The graduate can describe and discuss physical systems.*
- *The graduate can describe and discuss human systems.*
- *The graduate can describe and discuss environment.*

Applied Algebra

Applied Algebra is designed to help you develop competence in working with functions, the algebra of functions, and using some applied properties of functions. You will start learning about how we can apply different kinds of functions to relevant, real-life examples. From there, the algebra of several families of functions will be explored, including linear, polynomial, exponential, and logistic functions. You will also learn about relevant, applicable mathematical properties of each family of functions, including rate of change, concavity, maximizing/minimizing, and asymptotes. These properties will be used to solve problems related to your major and make sense of everyday living problems. Students should complete Applied Probability and Statistics or its equivalent prior to engaging in Applied Algebra.

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 graduate interprets the real-world meaning of various functions based on notation, graphical representations, and data representations.*
- *The graduate applies linear functions and their properties to real-world problems.*
- *The graduate applies polynomial functions and their properties to real-world problems.*
- *The graduate applies exponential functions and their properties to real-world problems.*
- *The graduate applies logistic functions and their properties to real-world problems.*
- *The graduate analyzes graphical depictions of real-world situations using functional properties.*
- *The graduate verifies the validity of a given model.*

Introduction to Humanities

This introductory humanities course allows candidates to practice essential writing, communication, and critical thinking skills necessary to engage in civic and professional interactions as mature, informed adults. Whether through studying

literature, visual and performing arts, or philosophy, all humanities courses stress the need to form reasoned, analytical, and articulate responses to cultural and creative works. Studying a wide variety of creative works allows candidates to more effectively enter the global community with a broad and enlightened perspective.

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 graduate assesses the development of humans through the study of key concepts, disciplines, and primary influences of the humanities.*

- *The graduate analyzes the primary contributions and characteristics of humanities during the Classical period.*

- *The graduate analyzes the primary contributions and characteristics of humanities during the Renaissance.*

- *The graduate analyzes the primary contributions and characteristics of humanities during the Neoclassical and Enlightenment period.*

- *The graduate analyzes the primary contributions and characteristics of humanities during the Romantic period.*

- *The graduate analyzes the primary contributions and characteristics of humanities during the Realism movement.*

Integrated Physical Sciences

This course provides students with an overview of the basic principles and unifying ideas of the physical sciences: physics, chemistry, and earth sciences. Course materials focus on scientific reasoning and practical, everyday applications of physical science concepts to help students integrate conceptual knowledge with practical skills.

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 graduate describes the nature and process of science.*

- *The graduate examines applications of physics including fundamental concepts such as forces, motion, energy, and waves.*

- *The graduate examines applications of key chemistry concepts including the structure of matter and the behavior and conservation of matter in chemical reactions.*

- *The graduate describes the underlying organization, interactions, and processes within the Earth system including the Earth's structure and atmosphere, and Earth's interactions within the solar system.*

Ethics in Technology

Ethics in Technology examines the ethical considerations of technology in each of four categories: privacy, accuracy, property, and access. The course presents a range of technologies and issues that challenge technologists in the field of information ethics. Students are introduced to a decision-making process as informed by ethical frameworks that outline key ethical considerations within the technologies presented. Students will study specific cases to help inform their professional responsibilities in how to navigate the important controversies in topics such as surveillance, social media, hacking, data manipulation, plagiarism and piracy, artificial intelligence, responsible innovation, and the digital divide. This course has no prerequisites.

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 graduate explains the role of ethical principles (i.e. theories, concepts, frameworks) in ethical decision-making in the information age.*

- *The graduate explains how IT professionals address ethical challenges regarding data privacy.*

- *The graduate explains how IT professionals address ethical challenges regarding data accuracy.*

- *The graduate explains how IT professionals address ethical challenges regarding data property.*

- *The graduate explains how IT professionals address ethical challenges regarding data access.*

- *The graduate explains how IT professional address the role of professional standards and codes of conduct in ethical decision-making.*

Critical Thinking: Reason and Evidence

In this course you will learn key critical thinking concepts and how to apply them in the analysis and evaluation of reasons and evidence. The course examines the basic components of an argument, the credibility of evidence sources, the impact of bias, and how to construct an argument that provides good support for a claim. The course consists of an introduction and four major sections. Each section includes learning opportunities through readings, videos, audio, and other relevant resources. Assessment activities with feedback also provide opportunities to check your learning, practice, and show how well you understand course content. Because the course is self-paced, you may move through the material as quickly or as slowly as you need to gain proficiency in the four competencies that will be covered in the final assessment. If you have no prior knowledge or experience, you can expect to spend 30-40 hours on the course content.

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 evaluates the quality of an argument*

- *The learner evaluates evidence based on source credibility.*

- *The learner evaluates bias and its impact.*

- *The learner makes claims based on evidence.*

Scripting and Programming

Scripting and Programming - Foundations

Scripting and Programming - Foundations provides an introduction to programming, covering basic elements such as variables, data types, flow control, and design concepts. The course is language-agnostic in nature, ending in a survey of languages and introduces the distinction between interpreted and compiled languages. There are no prerequisites for this course.

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 graduate examines basic computer programming elements, including data types, constants, variables, operators, and expressions.*

- *The graduate determines how to achieve programming goals through functions and control structure.*

- *The graduate interprets algorithms.*

- *The graduate describes steps of the software design process.*

- *The graduate compares various scripting and programming languages.*

Introduction to Programming in Python

Introduction to Programming in Python provides the fundamentals of the Python language and its features to control program flow and to manipulate data sets. This course teaches how to develop Python scripts that extract and manipulate data from unstructured data sources. Python libraries including acquisition and configuration are also covered. Scripting and Programming Foundations and Web Development Foundations are prerequisites to this course.

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 graduate integrates Python elements including data types, constants, variables, operators, and expressions to create programming solutions.*

- *The graduate constructs functions and control structures to interact with data structures and direct program flow.*

- *The graduate writes code in the Python environment, incorporating libraries to support data analytics tasks including data collection, manipulation, and storage.*

Data Management

Data Management - Foundations

This course introduces students to the concepts and terminology used in the field of data management. Students will be introduced to Structured Query Language (SQL) and will learn how to use Data Definition Language (DDL) and Data Manipulation Language (DML) commands to define, retrieve, and manipulate data. This course covers differentiations of data—structured vs. unstructured and quasi-structured (relational, hierarchical, XML, textual, visual, etc); it also covers aspects of data management (quality, policy, storage methodologies). Foundational concepts of data security are included.

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 graduate explains how data, databases, and data management are used in today's organizations.*

- *The graduate analyzes the relational model of data.*

- *The graduate implements SQL concepts and coding.*

- *The graduate demonstrates an understanding of the concepts involved in the modeling of data.*

- *The graduate demonstrates appropriate strategies to normalize data.*

- *The graduate interprets the concepts of analytical processing within the context of business intelligence.*

Data Management - Applications

This course covers conceptual data modeling and provides an introduction to MySQL. Students will learn how to create simple to complex SELECT queries including subqueries and joins, and students will also learn how to use SQL to update and delete data. Topics covered in this course include exposure to MySQL; developing physical schemas; creating and modifying databases, tables, views, foreign keys/primary keys (FKs/PKs), and indexes; populating tables; and developing simple Select-From-Where (SFW) queries to complex 3+ table join queries.

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 graduate creates conceptual data models and translates them into physical schemas.*

- *The graduate creates databases utilizing SQL Data Definition Language (DDL) in MySQL environment.*

- *The graduate writes code to create and modify tables and views employing SQL Data Definition Language (DDL) in MySQL environment.*

- *The graduate writes code to create and modify Primary Keys (PKs) and Foreign Keys (FKs) and Indexes with SQL Data Definition Language (DDL) in MySQL environment.*

- *The graduate populates tables with insert, update, and delete using DML in MySQL environment.*

- *The graduate creates simple Select-From-Where (SFW) and complex 3+ table join queries with Data Manipulation Language (DML) in MySQL environment.*

Advanced Data Management

Advanced Data Management enables organizations to extract and analyze raw data. Skillful data management allows organizations to discover and explore data in ways that uncover trends, issues, and their root causes. In turn, businesses are better equipped to capitalize on opportunities and more accurately plan for the future. As organizations continue to extract larger and more detailed volumes of data, the need is rapidly growing for IT professionals possessing data management skills. These skills include performing advanced relational data modeling as well as designing data marts, lakes, and warehouses. This course will empower software developers with the skills to build business logic at the database layer to employ more stability and higher data-processing speeds. Data analysts will gain the ability to automate common tasks to summarize and integrate data as they prepare it for analysis. Data Management is a prerequisite for this course.

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 graduate writes complex SQL statements in order to implement functions, stored procedures, and triggers to prepare data sets for data analysis and manipulation.*

- *The graduate configures data extraction, transformation, and loading tasks in order to automate data integration.*

Data Wrangling

This course elaborates on concepts covered in Introduction to Data Science, helping to develop skills crucial to the field of data science and analysis. It explores how to wrangle data from diverse sources and shape it to enable data-driven applications—a common activity in many data scientists' routine. Topics covered include gathering and extracting data from widely-used data formats, assessing the quality of data, and exploring best practices for data cleaning.

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 graduate conducts data extraction and wrangling with data in complex formats for parsing and scraping.*

- *The graduate ensures data cleanliness through auditing and intervention.*

Data Systems Administration

Data System Administration provides students with foundational skills to become a Database Administrator (DBA). This course illustrates how DBA's ensure businesses are able to leverage significant data to increase profitability and support key business functions. Topics include database management tools, account administration, recovery procedures, and maintenance through upgrades and migrations.

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 graduate performs database administration tasks from resource allocation to performance tuning.*

- *The graduate manages user accounts, roles, and privileges to enforce data access according to enterprise standards and policies.*

- *The graduate performs backup and restore procedures in accordance with enterprise policies and requirements.*

- *The graduate upgrades Oracle processes and procedures.*

Network and Security

Network and Security - Foundations

Network and Security - Foundations introduces students to the components of a computer network and the concept and role of communication protocols. The course covers widely used categorical classifications of networks (e.g., LAN, MAN, WAN, WLAN, PAN, SAN, CAN, and VPN) as well as network topologies, physical devices, and layered abstraction. The course also introduces students to basic concepts of security, covering vulnerabilities of networks and mitigation techniques, security of physical media, and security policies and procedures. This course has no prerequisites.

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 graduate identifies fundamental networking concepts to support an organization.*

- *The graduate identifies the fundamentals of network security concepts to support an organization.*

- *The graduate determines appropriate network security operations to protect an organization's assets.*

Networks

Networks for undergraduates focuses on the general concepts and applications of computer operating systems and network topologies. The fundamental knowledge and skills gained in this course prepares students for the CompTIA Network+ certification exam. Network and Security – Foundations is a pre-requisite for this course.

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 graduate configures basic networking components to support an organization's operations.*

- *The graduate manages a network infrastructure to support an organization's operations.*

- *The graduate manages networks to support an organization's operations.*
- *The graduate troubleshoots network issues in support of an organization's operations.*
- *The graduate manages network security to protect an organization.*

Full Stack Engineering

Version Control

Version control is critical to maintaining software and enabling scalability solutions. A best practice for any programming project that requires multiple files uses version control. Version control enables teams to have collaborative workflows and enhances the software development lifecycle. This course introduces students to the basics of publishing, retrieving, branching, and cloning. There are no prerequisites for this course.

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 implements version control processes and solutions that maintains source code.*

Business of IT

IT Leadership Foundations

IT Leadership Foundations is an introductory course that provides students with an overview of organizational structures, communication, and leadership styles specific to information technology in organizations. It also introduces students to some of the power skills that help make successful IT professionals, including time management, problem solving, and emotional intelligence. Students in this course explore their own strengths and passions in relation to the field. There are no prerequisites for this course.

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 graduate selects appropriate influential leadership strategies to effectively navigate workplace situations.*
- *The graduate communicates ideas, opinions, and information suitable for various professional settings.*
- *The graduate reflects on the emotional reactions of self and others in a variety of professional situations.*
- *The graduate recommends strategies for decision-making in various team environments.*

Business of IT - Project Management

In this course, students will build on industry standard concepts, techniques, and processes to develop a comprehensive foundation for project management activities. During a project's life cycle, students will develop the critical skills necessary to initiate, plan, execute, monitor, control, and close a project. Students will apply best practices in areas such as scope management, resource allocation, project planning, project scheduling, quality control, risk management, performance measurement, and project reporting. This course prepares students for the following certification exam: CompTIA Project+.

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 graduate applies key project management processes to guide business initiatives.*
- *The graduate determines the impact of project constraints and influences to manage risk.*
- *The graduate applies communication methods and change control processes to maintain clarity of project plans, activities, and changes for stakeholders.*
- *The graduate determines project tools and documentation methods to measure and monitor project performance.*

Business of IT - Applications

Business of IT—Applications examines Information Technology Infrastructure Library (ITIL®) terminology, structure, policies, and concepts. Focusing on the management of information technology (IT) infrastructure, development, and operations,

students will explore the core principles of ITIL practices for service management to prepare them for careers as IT professionals, business managers, and business process owners. This course has no prerequisites. This course prepares students for the Axelos ITIL v4 certification exam.

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 graduate understands the key concepts of service management.*
- *The graduate understands how the ITIL guiding principles can help an organization adopt and adapt service management.*
- *The graduate understands the four dimensions of service management.*
- *The graduate understands the purpose and components of the ITIL service value system.*
- *The graduate understands the activities of the service value chain, and how they interconnect.*
- *The graduate recognizes the purpose and key terms of 15 ITIL practices.*
- *The graduate understands 7 key ITIL practices.*

Web Development

Web Development Foundations

This course introduces students to web design and development by presenting them with HTML5 and Cascading Style Sheets (CSS), the foundational languages of the web, by reviewing media strategies and by using tools and techniques commonly employed in web development.

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 graduate creates web pages using a graphic user interface (GUI) editor as well as basic HTML5 and CSS 3 elements.*
- *The graduate develops a plan for creating and maintaining a website that addresses specific business needs while maintaining industry and ethical standards.*

Software

Scripting and Programming - Applications

Scripting and Programming - Applications for undergraduates explores the various aspects of the C++ programming language by examining its syntax, the development environment, and tools and techniques to solve some real-world problems.

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 graduate applies fundamental programming concepts in a specific programming environment.*
- *The graduate prepares code which declares, initializes, and assigns values to variables of appropriate types as part of the application development process.*
- *The graduate writes code that implements decision and loop constructs to control the flow of a program.*
- *The graduate creates arrays in order to solve complex problems.*
- *The graduate applies pointers to solve complex problems.*
- *The graduate writes code that creates and manipulates functions and files.*
- *The graduate applies object-oriented programming concepts in order to create a basic application.*

Technical Writing

Technical Communication

This course covers basic elements of technical communication, including professional written communication proficiency; the ability to strategize approaches for differing audiences; and technical style, grammar, and syntax proficiency.

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 graduate integrates basic elements of professional discourse, including audience analysis, the writing process, correct grammar, and appropriate design elements, into technical communication artifacts.*

- *The graduate makes strategic and appropriate communication decisions based on the audience.*

- *The graduate creates various technically written artifacts using appropriate technical communication concepts.*

General Science Content

Natural Science Lab

This course gives you an introduction to using the scientific method and engaging in scientific research to reach conclusions about the natural world. You will design and carry out an experiment to investigate a hypothesis by gathering quantitative data.

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 graduate evaluates academic sources for their credibility and relevance to a chosen research topic on a natural world phenomenon.*

- *The graduate accurately executes the process of scientific inquiry through experimentation in the natural world.*

- *The graduate draws conclusions based on academic research and scientific inquiry.*

Data Analytics

Data Analytics

This course covers the most common tools, techniques, and procedures involved in data analytics. Students will review all the disciplines involved with data analytics learned in previous courses and get a better understanding of how they all relate to one another.

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 graduate compares characteristics associated with data quality, structure, consolidation, and search optimization.*

- *The graduate determines business decisions using data analysis.*

- *The graduate evaluates data sources for purpose, value, access, and applications.*

- *The graduate analyzes simulation modeling and simulation outputs.*

- *The graduate recommends best-fit solutions via the appraisal of data analysis and reporting scenarios.*

Data Analysis with R

This course focuses on exploratory data analysis (EDA) utilizing R. EDA is an approach for summarizing and visualizing the important characteristics of a data set. Exploratory data analysis focuses on exploring data to understand the data's underlying structure and variables to develop intuition about the data set, to consider how that data set came into existence, and to decide how it can be investigated with more formal statistical methods.

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 graduate explains the principles and concepts of exploratory data analysis.*
- *The graduate conducts exploratory data analysis.*
- *The graduate predicts an outcome based on the results of the exploratory data analysis.*

Data Visualization

Data Visualization covers the application of design principles, human perception, color theory, and effective storytelling in the context of data visualization. It addresses presenting data to others and advancing technology with visualization tools, enabling data scientists to share their findings and support organizational decision-making processes. Additionally, this course focuses on how to visually encode and present data to an audience.

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 graduate defines key data elements in the context of data science.*
- *The graduate produces graphics from a given data set using visualization tools and techniques.*
- *The graduate incorporates best practices for design with focus on presentation elements.*
- *The graduate creates an interactive visualization that communicates the meaning of data to an appropriate audience.*

Data and Information Governance

Data and Information Governance provides students with the knowledge that establishing rules of engagement, policies, procedures, and data stewardship is essential to exercising organizational control over, and extracting maximum value from, its data assets. Good data governance helps an organization lower costs, create efficiencies, and achieve its strategic goals and objectives. Data governance provides a framework for properly managing information across the entire data lifecycle and establishes strategies in support of disaster recovery and continuity of operations. This course will prepare IT professionals to assist their organization in the definition and implementation of best practices related to the planning and implementation of managed systems that meet business, technical, security, auditing, disaster recovery, and business continuity requirements.

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 graduate creates data and information management plans including risk assessment, data recovery, and infrastructure solutions to support organizational functions and continuity of operations.*
- *The graduate recommends data and information governance policies, standards, procedures, and best practices.*

Data Science

Introduction to Data Science

This course introduces the data analysis process and common statistical techniques necessary for the analysis of data. Students will ask questions that can be solved with a given data set, set up experiments, use statistics and data wrangling to test hypotheses, find ways to speed up their data analysis code, make their data set easier to access, and communicate their findings.

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 graduate describes the foundations of data science.*
- *The graduate creates a data set that is usable for analysis by applying data wrangling techniques.*
- *The graduate incorporates statistical techniques to assist with parametric, nonparametric, and linear regression analyses.*

Machine Learning

This course presents the end-to-end process of investigating data through a machine learning lens. Topics covered include techniques for extracting data, identifying useful features that best represent data, a survey of commonly-used machine

learning algorithms, and methods for evaluating the performance of machine learning algorithms.

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 graduate evaluates algorithm performance.*
- *The graduate describes machine learning goals, categories, and procedures.*
- *The graduate determines appropriate classification algorithms to apply to data sets.*
- *The graduate determines appropriate regression algorithms to apply to data sets.*
- *The graduate determines appropriate clustering algorithms to apply to data sets.*
- *The graduate adjusts machine learning algorithms to optimize their performance by treating data anomalies, extracting data structures, and performing data transformations.*

Computer Science

Data Structures and Algorithms I

Data Structures and Algorithms I covers the fundamentals of dynamic data structures, such as bags, lists, stacks, queues, trees, hash tables, and their associated algorithms. With Python software as the basis, the course discusses object-oriented design and abstract data types as a design paradigm. The course emphasizes problem solving and techniques for designing efficient, maintainable software applications. Students will implement simple applications using the techniques learned.

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 graduate determines the appropriate implementation of data types to design efficient and maintainable software.*
- *The graduate determines which dynamic data structures are applicable for developing scalable software.*
- *The graduate decides on an efficient algorithm for developing usable software.*

Capstone

Data Management/Analytics Undergraduate Capstone

The Data Management/Analytics Undergraduate Capstone challenges students to demonstrate competencies supporting all BSDMDA program outcomes. Students will identify an organizational need, plan and develop a data analytics product to serve that need, and document the process in a project proposal and data project report.

This course covers the following competencies:

- *The graduate integrates and synthesizes competencies from across the degree program, thereby demonstrating the ability to participate in and contribute value to the chosen professional field.*

Accessibility and Accomodations

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.