The B.S. in Software Development program is designed to meet this growing need while preparing experienced information technology professionals for successful careers as software designers and developers.
Understanding the Competency-Based Approach

Practically speaking, what does it mean when we say that WGU’s programs are competency-based? Unlike traditional universities, WGU does not award degrees based on credit hours or on a certain set of required courses. Instead, you will earn your degree by demonstrating your skills, knowledge, and understanding of important concepts through a series of carefully designed courses.

Progress through your degree program is governed not by classes but by satisfactory completion of the required courses that demonstrate your mastery of the competencies. Of course, you will need to engage in learning experiences as you brush up on competencies or develop knowledge and skills in areas in which you may be weak. For this learning and development, WGU has a rich array of learning resources in which you may engage under the direction of your student mentor. You will work closely with your mentor to schedule your program for completing the courses. You will also work closely with additional faculty members as you proceed through courses of study that are designed to lead you through the content you must master in order to pass the assessment(s) for each course.

The benefit of this competency-based system is that it makes it possible for people who are knowledgeable about a particular subject to make accelerated progress toward completing a WGU 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, indeed, 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). The WGU Teachers College is accredited by the National Council for Accreditation of Teacher Education (NCATE). The nursing programs are accredited by the Commission on Collegiate Nursing Education (CCNE). The Health Informatics program is accredited by the Commission on Accreditation for Health Informatics and Information Management Education (CAHIIM).

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.
Students will 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 may need to take an online class or participate in a study module to acquire the knowledge and skills needed to pass the 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, you will complete preassessments to help your mentor form a profile of your prior knowledge and experience for use in creating your personalized Degree Plan.

**WGU’s Mentoring Approach**

The mentoring approach is a powerful component of the WGU educational experience. When you enroll at WGU, you will begin interacting with your student mentor, course mentors, and other support staff. Your student mentor will meet with you on a regular basis and take an active role and a personal interest in your success. Your student mentor will be your point of contact throughout your program and will be available to communicate with you via e-mail or phone. Your mentor will help you set weekly study goals, guide you to learning materials, help you understand what to expect in courses, and motivate you to work hard to complete your program. When you have questions or concerns, your mentor will help you resolve them.

As you work on each course, you will also be assigned course mentors. These course mentors are content experts who can discuss your learning for the course, help you find answers to content questions, and help you navigate the course successfully. Your course mentors are available to meet with you individually to provide personal support. You can also communicate with them by posting in the online learning community and participating in live discussion sessions such as webinars and cohorts.

Working closely with your own personal mentoring team will help you engage in the learning process and be a successful student while at WGU.

**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 have interactions with faculty and other students.

The resources in each course are specifically designed to support you as you develop competencies in preparation for your assessments through the utilization of reading materials, videos, tutorials, cohort opportunities, community discussions, and live discussions that are guided by content experts. 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 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 student 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 eight (8) competency units each term, and undergraduate students must enroll in at least twelve (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.

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

You will work with your mentor to select the various learning resources needed to prepare for the assessments in each course. In most cases, the learning materials you will use are independent learning resources such as textbooks, e-learning modules, study guides, simulations, virtual labs, and tutorials. WGU works with dozens of educational providers, including enterprises, publishers, training companies, and higher educational institutions to give you high-quality and effective instruction that matches the competencies that you are developing. The cost of most learning resources is included in your tuition, and you can enroll directly in those through your Degree Plan as your mentor has scheduled them. Some resources are not covered by your tuition, and you will need to cover those costs separately. WGU has excellent bookstore and library arrangements to help you obtain the needed 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.
<table>
<thead>
<tr>
<th>Course Description</th>
<th>CUs</th>
<th>Term</th>
</tr>
</thead>
<tbody>
<tr>
<td>Introduction to IT</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Critical Thinking and Logic</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>Elements of Effective Communication</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>English Composition I</td>
<td>3</td>
<td>1</td>
</tr>
<tr>
<td>English Composition II</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>IT Foundations</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Web Development Fundamentals</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>IT Applications</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>Introduction to Humanities</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Network and Security - Foundations</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Introduction to Geography</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>College Algebra</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>Networks</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Scripting and Programming - Foundations</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Introduction to Physics</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Introduction to Probability and Statistics</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>Scripting and Programming - Applications</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Principles of Management</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Operating Systems for Programmers</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Data Management - Foundations</td>
<td>3</td>
<td>5</td>
</tr>
<tr>
<td>Data Management - Applications</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Business of IT - Project Management</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Network and Security - Applications</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td>Data Management for Programmers</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Organizational Behavior and Leadership</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>Data Structures</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Software I</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>Software Engineering</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Business of IT - Applications</td>
<td>4</td>
<td>8</td>
</tr>
<tr>
<td>Software II - Advanced Java Concepts</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td>Client-Server Application Development</td>
<td>3</td>
<td>9</td>
</tr>
</tbody>
</table>
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. As these changes are implemented, WGU will ensure that the length of the student’s degree program (i.e., total competency unit requirements) will not increase and that competency units already earned will be applied to the updated program version. When program requirements are updated, students returning from term break or returning after withdrawal from the university will be expected to re-enter the updated version of the program.
Areas of Study for Bachelor of Science, Software Development

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

This course introduces students to 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:

- The graduate evaluates ethical concerns involved in the use of technology.
- The graduate recognizes and describes functions of basic computer hardware components.
- The graduate describes IT as a discipline and discusses the history and future of computing as well as the currently used infrastructure.
- The graduate explains the structure and function of databases.
- 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 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 role of technology in today’s business environment and describes basic concepts of project management.

IT Foundations

IT Foundations helps students gain an understanding the personal computer components, and their function, in a desktop system as well as computer data storage and retrieval; classifying, installing, configuring, optimizing, upgrading, and troubleshooting printers, laptops, portable devices, operating systems, networks, and system security; recommending appropriate tools, diagnostic procedures, preventative maintenance and troubleshooting techniques for personal computer components in a desktop system; strategies for identifying, preventing, and reporting safety hazards and environmental/human accidents in a technological environments; and effective communication with colleagues and clients as well as job-related professional behavior. This course prepares students for the following certification exam: CompTIA A+ Part I.

IT Applications

IT Applications helps students gain an understanding the personal computer components, and their function, in a desktop system as well as computer data storage and retrieval; classifying, installing, configuring, optimizing, upgrading, and troubleshooting printers, laptops, portable devices, operating systems, networks, and system security; recommending appropriate tools, diagnostic procedures, preventative maintenance and troubleshooting techniques for personal
computer components in a desktop system; strategies for identifying, preventing, and reporting safety hazards and environmental/human accidents in a technological environments; and effective communication with colleagues and clients as well as job-related professional behavior. This course prepares students for the following certification exam: CompTIA A+ Part I.

General Education

Critical Thinking and Logic
This course introduces students to the basic concepts of logic and critical thinking. Students are introduced to the use of logical principles to accurately express and establish the validity of various forms of reasoning. The main objective of the course is for students to understand the range of concepts and techniques employed by critical thinkers. Students learn how to correctly apply the principles of logic and cultivate the skills they need to be able to recognize, analyze, and critically evaluate arguments.

This course covers the following competencies:

- The graduate evaluates arguments, demonstrating validity through application of formal logic and methods.
- The graduate applies conceptual foundations of logic and critical thinking to patterns of thinking and reasoning.
- The graduate evaluates sophisticated types of reasoning through the concepts and methods of logic and critical thinking.

Elements of Effective Communication
Elements of Effective Communication introduces learners to elements of communication that are valued in college and beyond. Materials are based on five principles: being aware of your communication with yourself and others; using and interpreting verbal messages effectively; using and interpreting nonverbal messages effectively; listening and responding thoughtfully to others, and adapting messages to others appropriately.

This course covers the following competencies:

- The graduate applies foundational elements of effective communication.
- The graduate applies appropriate communication strategies in interpersonal and group contexts.
- The graduate demonstrates effective presentational communication strategies in a given context.

English Composition I
This course introduces learners to the types of writing and thinking that is valued in college and beyond. Students will practice writing in several genres and several media, with emphasis placed on writing and revising academic arguments. The course contains supporting media, articles, and excerpts to support a focus on one of five disciplinary threads (covering the topics of nursing, business, information technology, teaching, and literature, art, and culture) designed to engage students and welcome them into discussion about contemporary issues. The course supports peer review activities, though it may be completed asynchronously as well. Instruction and exercises in grammar, mechanics, research documentation, and style are paired with each module so that writers can practice these skills as necessary. This course includes full access to the MindEdge Writing Pad to support student writing and coaching sessions.

This course covers the following competencies:

- The graduate composes an appropriate argumentative essay for a given context.
- The graduate integrates credible and relevant sources into written arguments.
- The graduate uses appropriate writing and revision strategies
- The graduate composes an appropriate narrative for a given context.
- The graduate applies appropriate grammatical rules, sentence structure, and writing conventions.
- The graduate appropriately uses a given writing style.
The graduate selects appropriate rhetorical strategies that improve writing and argumentation.

**English Composition II**

English Composition II introduces learners to research writing and thinking that are valued in college and beyond. The Composition II course at WGU should be seen as a foundational course designed to help undergraduate students build fundamental skills for ongoing development in writing and research. Students will complete an academic research paper.

This course covers the following competencies:

- The graduate applies steps of the writing process appropriately to improve quality of writing.
- The graduate evaluates the quality, credibility, and relevance of evidence in order to integrate evidence into a final research paper.
- The graduate composes an argumentative research paper.

**Introduction to Humanities**

This introductory humanities course allows students 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 students to more effectively enter the global community with a broad and enlightened perspective.

This course covers the following competencies:

- 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 Realist movement.
- The graduate analyzes the primary contributions and characteristics of humanities during the Modernist movement.
- 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 Middle Ages.
- 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 Renaissance.
- The graduate analyzes the primary contributions and characteristics of humanities during the Baroque period.
- The graduate analyzes the primary contributions and characteristics of humanities during the Postmodernist movement.
- The graduate analyzes the primary contributions and characteristics of humanities within the Neoclassical and Enlightenment period.

**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:

- The graduate can describe and discuss environment.
- The graduate can describe and discuss places and regions.
- The graduate can describe and discuss fundamental concepts in geography.
- The graduate can describe and discuss physical systems.
- The graduate can describe and discuss human systems.
College Algebra
This course supports the assessment for College Algebra with Hawkes Learning. College Algebra provides a detailed exploration into basic algebraic concepts and functions and their use in describing, interpreting, and modeling real-world situations.

This course covers the following competencies:
- The graduate simplifies and factors polynomial expressions, and solves polynomial equations.
- The graduate combines functions, finds inverse functions, solves exponential and logarithmic equations and functions.
- The graduate simplifies rational, radical, and quadratic expressions, solves corresponding equations, and extends this knowledge to the study of functions.
- The graduate solves systems of linear equations and their related applications.
- The graduate classifies and performs operations on real numbers; solves linear equations and inequalities; connects a linear equation to its graph; and identifies a function.

Introduction to Physics
This course provides students with a comprehensive overview of the basic principles and unifying concepts of physics. Students will integrate conceptual knowledge with practical and laboratory skills. The primary audience of this course are IT majors with focus on application.

The course contains interactives, reading materials, and laboratory application to help students develop a broad understanding of the practical applications of scientific concepts. Instructional content is enhanced by e-interactives and laboratory activities that will give students hands on knowledge and experience. Focus of materials are on why science is important to everyday life, practical application, and conceptual understanding. The quantitative aspects of physics will be explored as they relate to modern problems and challenges of the everyday world.

Asynchronous and cohort experiences may be part of the learning experience in which community will support the educational process.

This course covers the following competencies:
- The graduate analyzes classical physics concepts to understand the world around them.
- The graduate applies concepts of electricity and magnetism to understand the world around them.
- The graduate analyzes concepts of modern physics.
- The graduate analyzes principles of thermodynamics.
- The graduate critically analyzes the nature and process of science.
- The graduate applies wave physics concepts to understand the world around them.

Introduction to Probability and Statistics
In this course, students demonstrate competency in the basic concepts, logic, and issues involved in statistical reasoning. Topics include summarizing and analyzing data, sampling and study design, and probability.

This course covers the following competencies:
- The graduate determines the probability of events using simulations, diagrams, and probability rules.
- The graduate evaluates categorical and quantitative data using appropriate numerical measures and graphical displays.
- The graduate designs and conducts observational studies, controlled experiments, and surveys to explore population characteristics.
- The graduate evaluates the sampling methods used in studies including the effect they have on conclusions that can
be made.

● The graduate evaluates the relationship between two variables through the creation and interpretation of numerical summaries and visual displays.

● The graduate applies theoretical or empirical probability to a situation to quantify uncertainty.

Web Development

Web Development Fundamentals
These courses introduce the fundamentals of web development, which will enable the student to design, develop, and deploy a website. Students will create web content using HTML 5 and gain the knowledge to style and create layouts using Cascading Style Sheets (CSS). Students will also learn how to host and upload a website to a free web server.

This course covers the following competencies:

● The graduate applies principals of HTML using block elements, inline level elements, lists, tables and various other elements for creating a web page.

● The graduate applies principles required to use an FTP client and web host to upload files for a website to a web server.

● The graduate applies concepts of Cascading Style Sheets (CSS) to a website and controls the style, design, and layout of a website.

Network and Security

Network and Security - Foundations
This course introduces students to the components of a computer network and the concept and role of communication protocols. The course will cover widely used categorical classifications of networks (i.e CAN, LAN, MAN, WAN) as well as network topologies, physical devices, and layered abstraction. The course will also introduce students to basic concepts of security, covering vulnerabilities of networks and mitigation techniques, security of physical media, and security policies and procedures.

This course covers the following competencies:

● The graduate identifies the basic concepts essential to network security.

● The graduate identifies the basic concepts essential to networking.

● The graduate identifies the functional and technical components of network systems.

Network and Security - Applications
This course prepares students for the following certification exam: CompTIA Security+.

This course covers the following competencies:

● The graduate identifies and discusses basic concepts of security and security threats, and recommends security procedures.

● The graduate explains and makes recommendations for appropriate security strategies and procedures for organizational operations.

● The graduate recommends appropriate methods for controlling accessing data and information and for authenticating users and groups in gaining that access.

● The graduate evaluates risks associated with network security and recommends monitoring strategies and methods.

● The graduate identifies and explains the role of encryption in network security.
• The graduate identifies security needs and recommends appropriate security practices for network infrastructures.

Networks

Networks focuses on: network topologies including: protocols, ports, addressing schemes, routing, and wireless communication standards; physical and logical topologies, including wiring standards; differentiating, installing, and configuring network devices; and troubleshooting network connectivity. This course prepares students for the following certification exam: CompTIA Network+.

This course covers the following competencies:

• The graduate uses hardware and software utilities to track and maintain network performance in optimized state.
• The graduate differentiates and installs/configures network devices.
• The graduate differentiates and explains network security devices and methods for troubleshooting common security threats.
• The graduate differentiates and explains physical and logical topologies, including wiring standards.
• The graduate identifies appropriate methodologies for troubleshooting network connectivity and performance issues in a given network environment.
• The graduate distinguishes and explains network topologies, including protocols, ports, addressing schemes, routing, and wireless communication standards.

Scripting and Programming

Scripting and Programming - Foundations

This course provides an introduction to programming covering data structures, algorithms, and programming paradigms. The course presents the student with the concept of an object as well as the object-oriented paradigm and its importance. A survey of languages is covered and the distinction between interpreted and compiled languages is introduced.

This course covers the following competencies:

• The graduate understands the concept of algorithms, can analyze algorithm efficiency, and understands recursion.
• The graduate understands the basic concepts of computer programming, including data types, constants, variables, operator types, expressions, and functions.
• The graduate understands the object-oriented programming paradigm.
• The graduate understands basic constructs of programming, including decisions and control structures.
• The graduate identifies steps of the design process, UML diagrams, and different programming languages and their applications.

Scripting and Programming - Applications

This course provides an introduction to programming. It covers data structures, algorithms, and programming paradigms. It presents the concept of an object as well as the object-oriented paradigm and its importance. A survey of languages is covered and the distinction between interpreted and compiled languages is introduced.

This course covers the following competencies:

• The graduate utilizes decision and loop constructs to control the flow of a program.
• The graduate understands the object-oriented programming paradigm and identifies its elements.
• The graduate declares, initializes, and assigns values to a variable and differentiates between primitive and object data types.
● The graduate defines programming languages, identifies common algorithms, and identifies the parts of the Java Programming Environment.

Leadership and Management

Principles of Management
This course addresses strategic planning, total quality, entrepreneurship, conflict and change, human resource management, diversity, and organizational structure.

This course covers the following competencies:

● The graduate can explain the strategic planning process.
● The graduate responds appropriately to diversity issues in the workplace.
● The graduate can describe how to establish and promote an entrepreneurial emphasis within an organization.
● The graduate can describe how to establish a total quality management program in a product operation and in a service operation.
● The graduate can recommend effective techniques for managing conflict and change.
● The graduate can correctly apply principles of human resource management in a given situation.
● The graduate can recommend an organizational structure to match a given organization’s situation.

Organizational Behavior and Leadership
Organizational Behavior and Leadership explores how to lead and manage effectively in diverse business environments. Students are asked to demonstrate the ability to apply organizational leadership theories and management strategies in a series of scenario-based problems.

This course covers the following competencies:

● The graduate can determine which type of team and team leadership should be used to accomplish a task or project.
● The graduate can recommend appropriate principles or techniques for guiding the development of a group.
● The graduate can develop and recommend how to implement effective performance evaluation processes.
● The graduate analyzes the culture within an organization to determine how to work effectively within that organization.
● The graduate can describe the effects of specified influences on individual behavior.
● The graduate can analyze leadership theories, methods, and tools in given situations and select the appropriate behavior of the leader.

Operating Systems

Operating Systems for Programmers
This course covers operating systems from the perspective of a programmer including the placement of the operating system in the layered application development model. Primarily OSs provide Memory Management, Task Scheduling, and CPU allocation. Secondarily, OSs provide tools for file storage/access, permission control, event handling, network access, and cross-process interaction. OSs also provide tools for debugging problems within a single process or within groups of programs.

This course covers the following competencies:

● The graduate describes mechanisms used by the operating system for protection and security and how they relate to software applications.
The graduate describes processes and threads and their relationship to multithreading and parallel programming.

The graduate describes operating systems, their functions, and their structure.

The graduate describes different file systems and I/O algorithms.

The graduate explains the different approaches to memory management and how they affect CPU utilization.

Data Management

Data Management - Foundations
This course introduces students to the concepts and terminology used in the field of data management. They 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 will be included.

This course covers the following competencies:

- The graduate demonstrates appropriate strategies to normalize data.
- The graduate demonstrates an understanding of the concepts of the relational model of data.
- The graduate demonstrates an understanding of the concepts involved in the modeling of data.
- The graduate demonstrates an understanding of the concepts involved in business intelligence and analytical processing.
- The graduate demonstrates a fundamental understanding of storage technologies.
- The graduate demonstrates an understanding of SQL concepts.
- The graduate demonstrates an understanding of data, databases, and data management.

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 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:

- The graduate creates and modifies tables and views employing SQL Data Definition Language (DDL) 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.
- The graduate creates and modifies Primary Keys (PKs) and Foreign Keys (FKs) and Indexes with SQL Data Definition Language (DDL) in MySQL environment.
- 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 populates tables with insert, update, and delete using DML in the MySQL environment.

Data Management for Programmers
This course introduces storage of various kinds and formats of data. Students will use standard SQL to demonstrate query capabilities provided by database management systems. The course will further cover data-related topics: data
presentation, security (access and encryption), transaction management, and administration (backup, disaster recovery, and performance tuning). This course will address advanced topics such as data warehousing, data mining and distributed databases.

This course covers the following competencies:

- The graduate logically and physically distributes data through the design of data warehouses, data marts, and distributed databases.
- The graduate administers data by performing backups, disaster recovery planning, and SQL performance tuning and query optimization.
- The graduate designs a conceptual and logical model for storing various formats and types of data in a database management system (DBMS).
- The graduate applies SQL Data Definition Language (DDL) to create, modify, and drop databases, tables, views, and indexes; employs SQL Data Manipulation Language (DML) to select, insert, update, and delete data in tables in a database management system (DBMS) environment; and programs in SQL Programming Language (PL/SQL) to run persistent applications such as stored procedures, functions, and triggers.
- The graduate secures data by designing and implementing access controls and encryption.
- The graduate manages data transactions through ACID (atomicity, consistency, isolation, durability) properties and concurrency control: serialization, locking methods, deadlock prevention, timestamping, and optimistic techniques.
- The graduate applies tools and technologies such as XML, warehouses, and data mining to extract and present data.

Data Structures

Students will learn the fundamentals of dynamic data structures, such as bags, lists, stacks, queues, trees, hash tables, and their associated algorithms, using object-oriented design and abstract data types as a design paradigm. The course emphasizes problem solving and techniques applied to the design of efficient, maintainable software applications. Students will implement simple applications using the techniques learned.

This course covers the following competencies:

- The graduate describes how to use searching algorithms for lists and explains the concept of a dictionary as an associative ADT.
- The graduate describes design, specification, and implementation of stacks, queues, and deques and implements a simple application using sequentially allocated queues as well as stacks that employ a linked allocation.
- The graduate describes design, specification, and implementation of list structures.
- The graduate identifies basic selection and insertion sorting algorithms, as well as faster sorting algorithms, and describes the design and implementation of sorted lists.
- The graduate explains how to design abstract data types (ADTs), data structures to represent an ADT in storage, and algorithms to manipulate ADTs (using the bag ADT as an example) and describes bag data types and the use of both sequential and linked allocation to implement them.
- The graduate describes tree structures and binary trees and implements a simple application involving building and searching a binary tree.
- The graduate describes the use of hash tables and bucket hashing as an efficient way to implement an associative ADT, and implements a simple application that uses bucket hashing.
- The graduate analyzes the time and space complexity of basic algorithms.

Business of IT

Business of IT - Project Management

This course introduces the student to the project management & business analysis process within the context of an IT project. Fundamental concepts of project management will be covered including all phase of project management during
a system life cycle including business analysis, requirements capturing, issue tracking, and release planning. Additional topics to include: development environments (dev, integration, QA, production), help desk and support, IT planning for business continuity. This course prepares students for the following certification exam: CompTIA Project+.

This course covers the following competencies:

- The graduate implements, controls, and coordinates projects according to project plans.
- The graduate creates a project plan.
- The graduate explains the strategies and processes of project closure, acceptance, and delivery.
- The graduate describes and explains key components of project plans.

Business of IT - Applications

This course introduces IT students to information systems (IS). The course includes important topics related to management of information systems (MIS), such as system development, and business continuity. The course also provides an overview of management tools and issue tracking systems.

This course covers the following competencies:

- The graduate recognizes the need for support center tool, and identifies ways to manage the support processes.
- The graduate defines the general principles of information systems (IS) and the role of IS in the business process within an organization.
- The graduate identifies the role of management in information systems and the necessity for security and contingency plans.
- The graduate defines the different methods of system development and selects the appropriate method for a project.

Software

Software I

This course focuses on skills and concepts students need to know, to understand, and to apply object-oriented concepts in the Java programming. This course prepares students for the following certification exam: Oracle Certified Associate Java Programmer.

This course covers the following competencies:

- The graduate uses object-oriented concepts and programming techniques to develop applications that are flexible and maintainable.
- The graduate develops and uses classes, interfaces, and variables in code development.
- The graduate applies appropriate control structures to develop robust applications.
- The graduate uses appropriate Application Programming Interface (API) classes and interfaces to perform efficient string, pattern, and stream processing.

Software Engineering

This course introduces the concepts of software engineering to IT core graduates. It is a standalone course that is critical to the IT program. It emphasizes the need for a disciplined approach to software engineering by providing an overview of software and software engineering processes and why they are challenging. A generic process framework is covered to provide the groundwork for formal process models. Prescriptive process models (e.g., Waterfall Model) and Agile Development is included. An introduction to the elements/phases of software engineering is introduced which includes Requirements Engineering (including UML, Use Cases), Design Concepts, Software Quality and Software Testing, and Project Management.

This course covers the following competencies:
The graduate describes software and legacy software; the core principles of software engineering, the generic process framework, introductory software engineering concepts and terms; and selects appropriate model activities when given project descriptions.

The graduate describes software design and design concepts and classes and identifies appropriate uses of design concepts for specific projects.

The graduate describes quality assurance processes and explains how to implement quality and software testing concepts in specific cases.

The graduate defines requirements engineering concepts, describes requirements engineering processes, and selects appropriate graphical models for specific projects.

The graduate describes software engineering process models (e.g., waterfall, agile methodologies) and selects appropriate models when given project descriptions.

Software II - Advanced Java Concepts
This course prepares students for the following certification exam: Oracle Certified Professional Java Programmer.

This course covers the following competencies:

- The graduate takes advantage of multithreading capabilities in Java.
- The graduate implements read statements and writes data from the file system and databases.
- The graduate designs advanced Java Classes and objects.
- The graduate implements error control in Java.

Software Applications

Client-Server Application Development
This course introduces students to client/server application programming classes, structures, and concepts. The course covers networking and client/server, streams, threads, URLs, URIs, HTTP, and socket programming concepts.

This course covers the following competencies:

- The graduate implements client and server sockets, including secure sockets.
- The graduate develops client/server applications that implement the Internet classes in Java, including proxies.
- The graduate explains the nature of streams and writes java code to implement and manipulate threads and streams.
- The graduate explains basic concepts of networking, including the Internet.

Mobile Application Development
This course introduces students to programming for mobile devices using a Software Development Kit (SDK). Students with previous knowledge of programming will learn how to install and utilize a SDK, build a basic mobile application, build a mobile applications using a graphical user interface(GUI), adapt applications to different mobile devices, save data, execute and debug mobile applications using emulators, and deploy a mobile application.

This course covers the following competencies:

- The graduate describes the Activity lifecycle in the mobile application, and creates and links an activity.
- The graduate explains ways to save data in a mobile application, and creates a data base in a mobile application.
- The graduate describes how to utilize the available hardware and services available in different devices.
- The graduate explains how to share information in mobile applications and creates a user-defined content provider.
- The graduate creates a user interface and describes how to handle user input.
• The graduate explains mobile development, develops a simple mobile application using the IDE, documents debugging the mobile application, and describes how to use an emulator.

• The graduate describes mobile application deployment and prepares and application for deployment.

Technical Writing

Technical Writing
The technical writing requirement draws from the evidence students have accumulated in improved proficiency in research and professional written communication; the ability to think about and write for different audiences; and improved style, grammar and syntax.

This course covers the following competencies:
• The graduate prepares a project proposal according to the guidelines specified in the program guide.

Capstone

IT Capstone Written Project
The capstone project consists of a technical work product and a report that details various aspects of the product. The final product will also include a journal that contemporaneously describes the candidate’s experience in developing the capstone. The topic of the capstone must be presented and approved by the student’s mentor.

*Requirements and instructions for completing the capstone can be obtained from the student’s mentor.

This course covers the following competencies:
• The graduate integrates and synthesizes competencies from across the degree program and thereby demonstrates the ability to participate in and contribute value to the chosen professional field.
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 administrative or accessibility issues. 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. The Student Services team provides a formal means by which you can express your views, which in turn will inform the decisions we make.

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., and Sunday from 10:00 a.m. to 7:00 p.m., mountain standard time.

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.

For the most current information regarding WGU support services, please visit the “Help” tab on the Student Portal at http://my.wgu.edu.