Program Guidebook

Master of Arts Science Education (Secondary Chemistry)

The Master of Arts Science Education (Secondary Chemistry) is a competency-based degree program that prepares already licensed teachers for an endorsement insecondary chemistry and provides the opportunity to develop skills in science curriculum development, design, and evaluation. All work in this degree program is online and includes Mathematics Content, General Science Content, Chemistry Content, and Science Education courses. All students complete a culminating Teacher Performance Assessment.

Understanding the Competency-Based Approach

Practically speaking, how do competency-based programs like those offered at Western Governors

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

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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.

External Content & Basic Skills Exams

Western Governors University requires that candidates pass the state-mandated content exam that aligns with their WGU program in addition to a basic skills exam (initial licensure programs only). Specific information regarding required content and basic skills exams required for each program and state can be found in the WGU Student Handbook. In many cases, it is the candidates' responsibility to register and pay for the required exams and submit their official passing score reports to WGU.

State Licensure Requirements

This program does not lead to state licensure.

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 0.311on items, matching, short answer5s4ay alsa0

Standard Path *for* Master of Arts Science Education (Secondary Chemistry)

Course Description	CUs	Term
Concepts in Science	1	1
Integrated Physical Sciences	2	1
General Chemistry I with Lab	3	1
General Chemistry II with Lab	3	1
Precalculus and Calculus	2	2
Physical Chemistry	3	2

Areas of Study for Master of Arts Science Education (Secondary Chemistry)

The following section includes the areas of study in the program, with their associated courses. Your

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 safe and effective investigations to answer testable research questions regarding the physical and chemical characteristics of matter.*
- *The graduate analyzes the electronic structure of atoms and periodic trends to explain the characteristics and behaviors of chemicals.*
- *The graduate explains how to use the periodic table and IUPAC nomenclature rules to name compounds and write chemical formulas.*
- *The candidate distinguishes the ways in which chemical bonds and electron orientation impact the structures and behavior of molecules to understand the composition of matter.*
- *The graduate writes balanced chemical equations to analyze what happens during a chemical reaction.*
- *The graduate analyzes quantities of substances consumed and produced to explain what happens during chemical reactions.*
- *The graduate analyzes the quantities of heat released or absorbed during chemical reactions to understand the behavior of heat under various circumstances.*
- *The graduate analyzes the physical states of matter to explain transformations in matter and energy.*

General Chemistry II with Lab

General Chemistry II with Lab for graduates continues the study of general chemistry for already-licensed teachers seeking an additional license or endorsement in secondary chemistry. Building on the topics covered in General Chemistry I, General Chemistry II examines the behavior of gases and solutions, reaction rates and equilibrium, acids and bases, and oxidation-reduction reactions. Also, this course provides an introduction to three subdisciplines of chemistry: organic chemistry, biochemistry, and nuclear chemistry. Laboratory experiences reinforce the essential skills required for conducting successful scientific investigations. C672: General Chemistry I for graduates 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 conducts effective scientific investigations to analyze chemical processes in real-world contexts.*
- *The graduate analyzes the relationships between volume, pressure, and temperature to solve problems using gas laws.*
- *The graduate examines the rate and process by which reactions occur to analyze chemical changes.*
- *The graduate analyzes solutions to generate new solutions and calculate their reactions.*
- *The graduate hypothesizes how acids and bases will react to control the outcomes of chemical reactions.*
- *The graduate balances oxidation-reduction (redox) equations to determine how substances are reduced and oxidized during chemical reactions.*
- *The graduate balances nuclear equations to demonstrate the rearrangement of subatomic particles during a nuclear reaction.*
- *The graduate determines the composition of key organic biochemical compounds to distinguish various macromolecules.*

Physical Chemistry

Physical Chemistry ê semr Þ iuw !

- *The graduate explains how the structure and composition of amino acids and proteins impact the human body.*
- *The graduate explains how the structure and function of myoglobin and hemoglobin impact the human body.*
- *The graduate explains how the structure and function of enzymes and inhibitors in reactions impact the human body.*
- *The graduate analyzes the role of ATP in carbohydrate metabolism and the impact of irregular ATP synthesis on the human body.*
- *The graduate explains how lipids are essential to the normal function of cells and the impact of abnormal lipid metabolism on the human body.*

Climate Change

- *The graduate has a conceptual knowledge of limit, continuity, differentiability, and integration; and applies these concepts to examples in mathematics and the sciences.*

Science Education

Science, Technology, and Society

Science, Technology, and Society explores the ways in which science influences and is influenced by society and technology. A humanistic and social endeavor, science serves the needs of ever-changing societies by providing methods for observing, questioning, discovering, and communicating information about the physical and natural world. This course prepares educators to explain the nature and history of science, the various applications of science, and the scientific and engineering processes used to conduct investigations, make decisions, and solve problems. 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 analyzes the relationships among themes that appear across multiple scientific ideas.*
- *The graduate analyzes the nature of science, including how science distinguishes itself from other ways of knowing.*
- *The graduate analyzes the historical development of science, including how scientific knowledge evolves.*
- *The graduate analyzes the various ways in which science, technology, and society are interrelated.*
- *The graduate analyzes socially relevant scientific issues to make informed decisions based on data and context.*
- *The graduate analyzes the principles, processes, and assumptions of investigations in science to engage students in the nature of inquiry.*
- *The graduate uses technology tools and mathematics to improve investigations and the communication of results.*
- *The graduate formulates testable hypotheses for scientific investigations.*
- *The graduate conducts investigations in science to solve open-ended prob <</MC-es 0.nce, insrves, pts i investigat/MCID 4afp/LBx3q thiac/C2/MCI4>TodylanttMC /LoblptMCID 21 plajEinact co*

  The graduate analyzes the principles, processes, and assumptions of investiga4ions in science to engage students in

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MA, Science Education Teacher Performance Assessment

MA, Science Education Teacher Performance Assessment contains a comprehensive, original, research-based curriculum unit designed to meet an identified educational need. It provides direct evidence of the candidate's ability to design and implement a multi-week, standards-based unit of instruction, assess student learning, and then reflect on the learning process. The WGU Teacher Performance Assessment requires students to plan and teach a multi-week standards-based instructional unit consisting of seven components: 1) contextual factors, 2) learning goals, 3) assessment, 4) design for instruction, 5) instructional decision-making, 6) analysis of student learning, and 7) self-evaluation and reflection.

This course covers the following competencies:

- *The graduate evaluates the teaching context to accommodate student differences to plan for instruction and assessment.*
- *The graduate recommends improvements for instruction and professional practice through personal reflection.*
- *The graduate plans learning environments that support individual learning, collaboration, and positive social interaction.*
- *The graduate demonstrates ethical responsibilities and appropriate teaching dispositions, including those outlined in the Western Governors University Teachers College Code of Ethics.*
- *The graduate plans comprehensive learning segments of instruction and assessment that align with standards and the needs of students.*
- *The graduate applies instructional strategies that promote learning, engage students, and provide differentiated instruction.*
- *The graduate recommends strategies that support the development of academic language for all students.*
- *The graduate integrates strategies to develop academic language that facilitates effective student participation and engagement in learning.*
- *The graduate utilizes assessment data to profile student learning, communicate information about student progress and achievement, and guide and modify instruction.*
- *The graduate integrates a variety of strategies and resources to differentiate instruction and meet the needs of diverse learners.*
- *The graduate evaluates teaching experiences including the planning and implementing of curriculum and instruction through ongoing reflection.*
- *The graduate develops appropriate plans for professional growth in subject matter knowledge and pedagogical skills, including habits and skills of continual inquiry and learning.*

Accessibility and Accommodations

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

Need More Information? WGU Student Services

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