

# Teaching and Learning

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## Courses

Visit online course listings to view semester offerings for U08 Educ (<https://courses.wustl.edu/CourseInfo.aspx?sch=U&dept=U08&crslvl=5:8>).

### U08 Educ 500 Independent Study

Prerequisite: Permission of instructor. Permission to enroll is given in McMillan 215. The amount of credit will be determined in each case, with a maximum of 6 credit units.  
Credit variable, maximum 6 units.

### U08 Educ 503 Foundations of Educational Research

Educational researchers in today's world use an interdisciplinary toolbox of approaches to examine the complex issues facing today's students, teachers, educating institutions, and communities. Providing an introduction to the basic concepts, philosophies, and kinds of methodologies used in educational research, this course will examine research designs such as experiments, surveys, mixed methods, ethnography, and action research. Students will be required to analyze the strengths, weaknesses, and limitations of each. Furthermore, the course is devoted to understanding the importance of identifying a research problem, the literature review, research questions, and the alignment with appropriate methodologies (quantitative, qualitative, or mixed methods) in responding to the research inquiry. Enrollment note: Undergraduate students should register for Educ. 403, while graduate students should register for Educ. 503  
Same as L12 Educ 403  
Credit 3 units. A&S IQ: SSC EN: S

### U08 Educ 511 Child Development

This course serves as an introduction to developmental theory and research methods by highlighting the various processes (including biological and sociocultural forces) that influence human psychological change. Emphasis is given to normative social-emotional and cognitive development in childhood, using current empirical studies as the basis for student exploration, discussion, and debate.  
Same as L12 Educ 512  
Credit 3 units.

### U08 Educ 5125 Advanced Teaching Methods: Elementary - Fall

In this course, students will continue to refine their vision for high quality instruction in an elementary Language Arts and Mathematics classroom. Language Arts: students will build upon their understanding of best practices in elementary literacy by designing the structure for a Balanced Literacy block in their classrooms. These literacy blocks include instructional time devoted to explicit phonics instruction, shared reading, guided reading, read-aloud instruction, and vocabulary instruction. Students will also focus on writing instruction and will implement writing mini-lessons and student conferences in their

classrooms. Mathematics: This course will also build on students' understanding of effective mathematics instruction and their knowledge of both direct instruction and inquiry-based approaches to learning. Students will explore effective instructional strategies through the lens of content, with a core focus in Basic Operations (addition, subtraction, multiplication, and division); Geometry, Fractions and Measurement; & Problem-Solving, Algebra, and Graphing. By analyzing instruction through the lens of specific mathematical concepts, students will have the opportunity to design lessons that focus on the connections between mathematical content as well as the standards for mathematical practice. Students must have instructor approval to register.

Credit 1.5 units. UColl: OLH

### U08 Educ 5126 Advanced Teaching Methods: Secondary English/Language Arts - Fall

In this course, students will continue to refine their vision for high-quality English/language arts instruction in a secondary classroom. This course will build upon students' understanding of effective novel studies and writing units by focusing on the fundamentals of close reading, word study, embedded nonfiction, and "writing for reading" strategies. Sophisticated discussions are one of the hallmarks of advanced practice in ELA classrooms. Middle and high school students must be able to fluently use academic language and to internalize habits of discussion. This course will also focus on the role of discussion in an ELA classroom, and students will implement multiple discussion formats, including Socratic Seminars and Literature Circles. Students in this course will revisit the concept of rigor in a secondary ELA classroom by discussing the importance of text selection, studying text attributes and leveling systems, and analyzing the text selections embedded in their school's curriculum. Students must have instructor approval to register.

Credit 1.5 units. UColl: OLH, OLI

### U08 Educ 5127 Advanced Teaching Methods: Secondary Mathematics - Fall

In this course, students will continue to refine their vision for high-quality mathematics instruction in a secondary classroom. Students will revisit the fundamental design elements present in inquiry-based lessons, focusing on the development of their students' conceptual understandings. The course will also focus on the importance of computational and procedural fluency, and students will create a backwards plan that allows for daily fluency practice within their classrooms. Moving beyond fundamental lesson planning and assessment structures, students in this course will learn specific strategies to develop and assess their students' problem-solving skills and abilities and to implement effective discourse in their mathematics classrooms. Students will design instructional activities that allow their students to explore and discuss challenging problems and tasks through structures such as problem-solving seminars and performance-based assessments. Students must have instructor approval to register.

Credit 1.5 units. UColl: OLH

### U08 Educ 5128 Advanced Teaching Methods: Secondary Science - Fall

In this course, students will continue to refine their vision for high-quality science instruction in a secondary classroom. Moving beyond fundamental lesson planning and assessment structures, students in this course will learn specific strategies to develop and assess their students' problem-solving skills and abilities and to implement effective discourse in their science classrooms. Students will design instructional activities that allow their students to explore and discuss challenging problems and tasks through structures such as problem-solving seminars and performance-based assessments. Students must have instructor approval to register.

Credit 1.5 units. UColl: OLH, OLI

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#### **U08 Educ 5140 MATL Capstone Seminar I**

The first semester of the year-long Capstone course will focus on the foundations of building a goal-driven classroom. When the school year begins, students will embark upon the important work of getting to know their students and their school setting. Building on their knowledge of data-driven instruction, students will use the information gained about their teaching placement and their students in order to set ambitious goals both for their classroom as a whole and for individual students. Students will also use investment and engagement strategies to launch their vision and goals with their students. Throughout the semester, students will acquire new skills related to data analysis and remediation. Students will be asked to develop a classroom vision, academic and social-emotional goals, systems to track and share progress, and a classroom management and investment plan. An important component of the Capstone course will be one-on-one instructional coaching. The Capstone coach will support each student as they work to apply the content of the course to their individual schools and classrooms. The coaching cycle will consist of a classroom observation, a coaching conversation, and follow-up action steps, and this will occur on a biweekly basis. Prerequisite: instructor approval.

Credit 3 units. UColl: OLH

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#### **U08 Educ 5141 MATL Capstone Seminar II**

During semester two of the Capstone Seminar, students will begin drafting their Master's Capstone. Students will curate a Capstone portfolio, displaying their best work from the past two years of teaching. Students will also report on their students' final achievement and socio-emotional growth results. In sum, the final Capstone will consist of the Capstone portfolio, a film of an outstanding lesson, the presentation of a data narrative, and the delivery of an oral defense. For the oral defense, students will present and defend their K-12 students' growth and achievement data, as well as key learnings from their residency and master's course work, to faculty members and guests. Prerequisite: Instructor approval.

Credit 3 units. UColl: OLH, OLI

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#### **U08 Educ 515 Continuing the Portfolio Process**

This course involves a seminar format that is used to facilitate continuing portfolio development. There is emphasis on making connections between university course work and individual teaching practice, and there is ongoing professional dialogue with peers and mentors to provide direction and collegial support as students use the portfolio process to construct meaning out of their teaching experience and provide a clearer vision of their growth and development as teachers.

Credit 1 unit.

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#### **U08 Educ 590 Graduate Independent Study**

Prerequisite: permission of instructor.

Credit variable, maximum 6 units.

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#### **U08 Educ 6001 Topics in Education: Hands-On Science K-8: Electricity and Magnetism**

This course includes laboratory experiences, discussions, and lectures designed to prepare teachers to implement or strengthen hands-on science teaching in grades K-8. Inquiry activities illustrating electrical and magnetic principles will be selected in congruence with the National Science Education Standards and the Missouri Show-Me Standards. Prerequisite: Permission of instructor; intended for in-service teachers.

Credit 3 units.

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#### **U08 Educ 6002 Topics in Education: Hands-on Science K-8: Life Cycles and Heredity**

This course includes laboratory experiences, discussions, and lectures designed to prepare teachers to implement or strengthen hands-on science teaching in grades K-8. Inquiry activities illustrating the sexual and asexual life cycles of plants, animals, fungi, and microbes will be selected in congruence with the National Science Education Standards and Missouri Show-Me Standards. Prerequisite: Permission of instructor; intended for in-service teachers.

Credit 3 units.

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#### **U08 Educ 6005 Scientific Inquiry for the Classroom Teacher**

An inquiry-based course for practicing teachers in the elementary and middle school, grades K-8. Teachers will strengthen their conception of inquiry-based teaching as they learn to create a culture of inquiry in their classroom to nourish 21st-century learners through STEM. Teachers will learn how to incorporate thinking routines as they encourage students to explain phenomena and design solutions to real-world problems. Teachers will learn strategies for encouraging collaboration and active learning. The continuum of inquiry will be explored as teachers learn how to move to student-centered learning that encourages lifelong learning through inquiry. A school-based implementation project will be required. Topics to vary by semester. Prerequisite: permission of instructor. For STEM Teacher Quality Institute students only.

Credit 3 units. UColl: OLH, OLI

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#### **U08 Educ 6006 Science Inquiry for Educators**

Laboratory experiences and discussions designed to help teachers use inquiry methods in the K-8 classroom. Science themes, structured in accordance with national and state educational standards, will be variable by semester. Classroom project required. Course is intended for in-service teachers. Permission of instructor required.

Credit 3 units.

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#### **U08 Educ 6007 Advanced Scientific Inquiry for Educators**

This course is designed to prepare teachers to strengthen skills associated with the delivery of a successful inquiry-based science curriculum in the K-8 classroom. Through laboratory experiences and discussions, teachers will work on developing questioning strategies, sequencing activities to support the various experiential levels of students, and developing relevant lessons and activities from student questions. Classroom project required. Course is intended for in-service teachers. Prerequisite: permission of instructor.

Credit 3 units.

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#### **U08 Educ 6008 Teaching the Process of Scientific Investigation**

This course is intended for in-service teachers. Participants will engage in the process of scientific investigation while developing hands-on lessons for their students that support their ability to understand the nature of the scientific process of problem solving. The focus will be on pedagogical strategies that help foster independent investigation among students. Classroom project is required. For STEM Teacher Quality Institute students only.

Credit variable, maximum 3 units. UColl: OLH, OLI

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#### **U08 Educ 6009 Hands-On Science K-8: Matter and Energy**

This course includes laboratory experiences, discussions, and lectures designed to prepare teachers to implement or strengthen hands-on science teaching in grades K-8. Inquiry activities illustrating basic matter as well as energy and chemistry concepts will be selected in congruence with the National Science Education Standards and the Missouri Show-Me Standards. Prerequisites: Permission of instructor; for STEM Teacher Quality Institute students only.

Credit 3 units. UColl: OLI

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**U08 Educ 6010 Hands-On Science K-8: Mathematics Concepts**

Discussion intensive and lecture course designed to prepare teachers to implement or strengthen hands-on mathematics teaching in grades K-8. Inquiry activities illustrating numeration, rational numbers, and ratios will be selected in congruence with the NCTM Principles and Standards for School Mathematics, the National Science Education Standards, and the Missouri Show-Me Standards. Prerequisite: permission of instructor; intended for in-service teachers. Credit 3 units.

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**U08 Educ 6012 Hands-On Science K-8: Earth and Planetary Systems**

Laboratory experiences, discussion and lectures designed to prepare teachers to implement or strengthen hands-on science teaching in grades K-8. Inquiry activities illustrating planetary motion, tides, lunar phases, constellations, comets, terrestrial planets, gas giants, plate tectonics, volcanoes, and earthquakes will be selected in congruence with the National Science Education Standards and Missouri Show-Me Standards. Registration fee collected first night of class. Prerequisite: permission of instructor; intended for in-service teachers. Credit 3 units.

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**U08 Educ 6013 Scientific Inquiry: Advanced Pedagogy for Educators**

This course is designed to prepare teachers to strengthen skills associated with the delivery of a successful inquiry-based science curriculum in the K-8 classroom. Through laboratory experiences and discussions, teachers will work on a variety of pedagogical skills including developing questioning strategies and sequencing activities to support the various experiential levels of students. Participants will conduct an implementation project at their school or learning site. Scientific themes, structured in accordance with national and state standards, vary by semester. Credit 1.5 units. UColl: OLH, OLI

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**U08 Educ 6015 Hands-On Science K-8: Earth Systems**

Laboratory experiences, discussion, and lectures designed to prepare teachers to implement or strengthen hands-on science teaching in grades K-8. Inquiry activities involving the water cycle, erosion, the earth's composition, weather patterns, geology, and natural resources will be selected in congruence with the National Science Education Standards and the Missouri Show-Me Standards. Registration fee collected the first night of class. Prerequisite: permission of instructor; intended for in-service teachers. Credit variable, maximum 3 units. UColl: OLH

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**U08 Educ 6018 Hands-on Science K-8: Diversity of Life**

This course includes laboratory experiences, discussion, exploration of different teaching strategies, and lectures designed to prepare teachers to implement or strengthen hands-on science teaching in grades K-8. The course topics include the taxonomy and characteristics of the major groups of protists, plants, and animals as well as issues affecting biodiversity (genetic, species, and ecosystem diversity). Inquiry activities that illustrate the content are selected in congruence with the National Science Education Standards and Missouri Show-Me Standards. A registration fee is collected the first night of class. Prerequisite: permission of instructor; intended for in-service teachers, grades K-8. Credit 3 units.

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**U08 Educ 6019 Researched Practices in Math Instruction**

A pedagogy course for practicing teachers in the elementary and middle school, grades K-8. The course is an introduction to research-proven practices in mathematics, supported by math content. These pedagogical practices include the use of student-work to inform conceptual development, the use of small-group instruction as situated in a diverse set of classroom organizational patterns, approaches to conceptual change and conceptual development, uses of formative assessment, direct instruction, etc. For any particular workshop, a set of approaches and the research associated with it are presented in relation to standards-based content topics. Participants are engaged in developing their math content and pedagogical skills with a primary emphasis on the learning of high quality classroom practices. Participants conduct an implementation project at their school or learning site to ensure that what they learn is effectively applied within their own classroom setting. Credit 3 units. UColl: OLH

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**U08 Educ 6022 Improving Content and Instruction: Algebra**

This course will focus on topics in algebra, including topics covered in the national framework standards document for grades 4 through 9. Prerequisites: Must be a practicing teacher and have approval of the instructor to enroll. Credit 3 units. UColl: OLH

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**U08 Educ 6023 Scientific Inquiry: Advanced Pedagogy for Educators, Part II**

This course is designed to prepare teachers to strengthen skills associated with the delivery of a successful inquiry-based science curriculum in the K-8 classroom. Through laboratory experiences and discussions, teachers will work on a variety of pedagogical skills including developing questioning strategies and sequencing activities to support the various experiential levels of students. Participants will conduct an implementation project at their school or learning site. Scientific themes, structured in accordance with national and state standards, vary by semester. This is Part II of a two-part series. Credit 1.5 units.

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**U08 Educ 6024 Leadership In Scientific Inquiry**

In this course, students review literature related to science teacher leadership. Students conduct an implementation project in which they direct a test of change, a defined professional development program, or another leadership experience targeting a specific audience. Students read and discuss different models for inquiry-driven change, implement an innovation, collect and analyze data, and determine impact. Credit 3 units.

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**U08 Educ 6025 Reading and Writing in the Science Content Area**

This course will study the theoretical frameworks underlying literacy (reading and writing) instruction in the science classroom. Teachers in this course will learn research-based instructional methodologies to support disciplinary literacy and content literacy practices. Teachers will gain an understanding of how explicit literacy instruction connects with and supports three-dimensional curriculum and instruction. Teachers will use trade books, implement strategies to teach the comprehension of scientific text, and explore ways to support student writing in the science classroom, including using graphic organizers, note-taking strategies, and constructing written explanations and lab reports. Teachers will apply their learning to develop unit plans and lesson plans that strategically incorporate literacy strategies to support student learning in the science classroom. A class project is required. Credit 3 units. UColl: OLI

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**U08 Educ 6026 Improving Content and Instruction: Probability and Statistics (K-8)**

Students will learn how to analyze the progression of learning that students encounter in middle and high school and how to engage students in probability and statistical thinking using authentic learning opportunities. The course will give teachers the opportunity to learn and practice research-based strategies for teaching these concepts and skills to students.

Credit 3 units.

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**U08 Educ 6027 Equity in the Math Classroom**

Students will consider ways to embed equitable practices in the math classroom by studying practices that support access to math knowledge and thinking for all students. They will discuss the historical context that has led to inequality in the American classroom and practice embedding inclusive practices into math teaching in service of closing the achievement gap in our schools, especially for girls and students of color. For STEM Teacher Quality Institute students only.

Credit 3 units. UColl: OLH, OLI

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**U08 Educ 6028 Computational Thinking Across the Curriculum**

This course focuses on applying computational thinking across disciplines in grades K-8. Teachers will develop their understanding of the main concepts and skills involved in computational thinking and learn how to incorporate these into their curriculum across domains. A classroom implementation project is required.

Credit 3 units.

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**U08 Educ 6029 Educational Technology**

The course will emphasize how to use technology in meaningful ways. Teachers in this course will critically evaluate the purpose, potential privacy concerns, and cognitive barriers of ed-tech hardware and software. They will learn how to use educational technology to create opportunities for deeper learning. A classroom project is required.

Credit 3 units.

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**U08 Educ 6030 Engineering Across the Curriculum**

This course is designed to introduce teachers to how engineering concepts can be used to engage students in learning via interdisciplinary lessons. Teachers will engage in and develop learning experiences that utilize different resources to engineer solutions. Resources may include devices, robots, software, and materials easily found in classrooms. A classroom implementation project is required.

Credit 3 units.

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**U08 Educ 6031 Introduction to Computer Science Teaching**

This course is designed to introduce teachers to the fundamental concepts and practices of computer science (CS). Teachers will be engaged in experiences designed to provide authentic, meaningful experiences with both CS topics and pedagogy. Current Missouri CS Standards and the K-12 CS Framework will be used as a framework for discussion. A classroom project is required. For STEM Teacher Quality Institute students only.

Credit 3 units. UColl: OLH, OLI

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**U08 Educ 6100 Practical Strategies for Teachers to Effect Personal Change**

This course features six 1-credit-unit sections that cover diverse topics. The course is designed for teachers who want to develop skills and knowledge that they can apply in their classrooms. The sections do not overlap; each is independent of the others. Teachers may choose to enroll in as few (one) or as many (up to six) topic sections as they

desire, and they will receive 1 credit unit for each topic section they successfully complete. Students can enroll in more than one section at a time up to a maximum of six. For STEM Teacher Quality Institute participants only.

Credit 1 unit.

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**U08 Educ 7000 Teaching Physical Science: Inquiry Methods for 9-12 Teachers**

This course is designed for high school teachers of both the physical and life sciences. Participants will be engaged in developing their physical science content knowledge as it relates to inquiry-based pedagogy in both physical science and integrated life science curricula. Participants are required to conduct research on a classroom implementation project.

Credit 3 units.

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