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Graduate School of Education
http://www.lesley.edu/prek-12-education-programs/

ADVANCED PROFESSIONAL CERTIFICATE

SCIENCE IN EDUCATION

ONLINE PROGRAM

Leads to endorsement in multiple states

Lesley University's online Advanced Professional Certificate in Science in Education, which meets endorsement requirements in multiple US states, is designed for classroom teachers, curriculum specialists, and instructional resource persons responsible for science education in grades 1-8. The program consists of five courses, of which two are required and three may be chosen according to the educator's needs and interests or to meet state endorsement/second license requirements. Coursework encourages students to take a hands-on, interactive approach to teaching science.

This certificate program may be used as a specialization to fulfill some of the requirements for the MEd Individually Designed Program for Educators and the MEd in Educational Technology.

Please note: In certain states, a student may receive an endorsement/second license by completing the 21-credit program below. It is important to check with your teacher licensing office, as additional steps may be necessary in order to meet state requirements.

Program Prerequisite: Initial teacher license or signed non-licensure agreement

Courses may have prerequisites for registration; please check course descriptions before registering.

Course Number	Course Title	Course Credits
Required Courses		**6**
CNSCI 5100	Introduction to Physical Science*	
EDSCI 5200	Engineering STEM Solutions*	
Electives (Choose **3** of the following 3-credit courses)		**9**
EDSCI 6120	Physics of Mechanics	
EDSCI 6110	Life Science	
EDSCI 6115	Earth and Space Science	
EDSCI 6100	Green Chemistry	
EDSCI 6105	Natural Disasters	
CNSCI 5101	Investigations in Space Science	
CNSCI 6104	Investigations in Particles, Fields, and Waves	
EDSCI 6018	Learning, Design, and Robotics: Gateway to Critical Thinking	
EDSCI 6125	Sustainable Engineering	
TOTAL CREDITS		**15**

**Must be taken before any other EDSCI course in this program.*

Accreditation:
Lesley University is accredited by the New England Association of Schools and Colleges and is authorized to offer degree programs in many states.

For more information, please visit our website lesley.edu

Please Note: Lesley University reserves the right to unilaterally add, withdraw, or revise any course offering in the above mentioned program of study including policies, provisions, requirements, and fees.

Lesley University is an Affirmative Action/Equal Opportunity institution and does not discriminate on the basis of age, race, religion, color, creed, national or ethnic origin, sex, sexual orientation, handicap or disability in its education programs, employment, or in admissions to, access to or treatment in its programs or activities.

Required Course Descriptions

CNSCI 5100 Introduction to Physical Science
In this introductory course on science inquiry participants investigate common everyday phenomena. This course invites participants to "uncover" the complexity of a simple glass of water. They observe physical processes at play in this familiar system and develop scientific "habits of mind." Participants see how scientific principles can be applied to understanding the world around us. The following key physical science concepts are explored: density, displacement, buoyancy, melting, freezing, equilibrium, phase changes and energy transfers.

EDSCI 5200 Engineering STEM Solutions
This course focuses on the use of the engineering design process to solve problems within a science context integrating STEM content. Participants investigate case studies of real engineering problems in the field, bridge content to practice, and begin to visualize research in an interdisciplinary context. Through the use of technology and design, participants deepen analytical and problem solving skills. Teachers will also become familiar with engineering education applications and learn to modify for their classroom.

Elective Course Descriptions

EDSCI 6120 Physics of Mechanics
The course approaches the study of physics called Mechanics. The purpose of this course is threefold: (1) to extend understanding of key physics concepts through guided investigation, (2) to understand how physics concepts apply to everyday phenomena, and (3) to understand conceptual understanding of the physics of Mechanics and the strategies for addressing them. Through both hands-on experimentation and computer simulation, you will learn to investigate nature as a physicist does. *Prerequisite: CNSCI 5100 or EDSCI 5200*

EDSCI 6110 Life Science
Biology is the prevalent crucial language used to describe and understand life. This course will immerse students in the words and stories interwoven in the landscape of life from ecosystems to cells. Biological knowledge from this course allows you to engage in the world, understand what is happening around you systemically, and join the conversation of life. More than ever before, it is incredibly important to be competent in the language of life as we continue to engage in activities that have myriad, far-reaching impacts. *Prerequisite: CNSCI 5100 or EDSCI 5200*

EDSCI 6115 Earth and Space Science
Processes that operate on Earth, Earth's place in the solar system, and the universe will be explored. Using a "large scale to smaller scale" approach, we will study the vastness of the universe: its stars first, then the solar system, and finally Earth's systems. Additional systems to be explored include Earth materials, plate tectonics, water and Earth's surface processes, weather and climate, and bio-geology. *Prerequisite: CNSCI 5100 or EDSCI 5200*

EDSCI 6100 Green Chemistry
The primary objective of this course is to have a basic understanding of chemistry, with a special focus on being "green." The class will start with an in-depth understanding of the periodic table and various properties of atoms and their implications. Participants will learn about various chemical bonds and chemical reactions, followed by the principles of green chemistry, emerging technology, and engineering to sustain a greener society. *Prerequisite: CNSCI 5100 or EDSCI 5200*

EDSCI 6105 Natural Disasters
This course provides an introduction to the causes, occurrence, and consequences of natural and human-induced disasters. Students will analyze the physical causes, as well as the distribution and frequency, of disasters in order to understand the steps that might be taken to reduce their impact. Topics to be discussed include earthquakes, tsunamis, volcanoes, tornadoes, hurricanes, floods, wildfires, and impacts with celestial objects. The engineering design process will be integrated within the course activities. *Prerequisite: CNSCI 5100 or EDSCI 5200*

CNSCI 5101 Investigations in Space Science
This course focuses on the study of the Universe-the totality of all space, time, matter, and energy. The organization of course content will take an "Earth Out" approach by studying the relatively familiar solar system before the discussion of stars and galaxies. The following topics will be explored: the history and tools of astronomy, the solar system, the Sun and stellar evolution, and Cosmology- the fate of the universe.

CNSCI 6104 Investigations in Particles, Fields and Waves
Participants develop their understanding of the physics of fields and waves through guided inquiry. They investigate electricity, magnetism, sound, waves and light through observation, hands-on experimentation, simulation, video, graphical representations and discussions. Participants apply their understanding of the physics that lay beyond the range of our senses to everyday occurrences and devices. *Prerequisite: EDSCI 6120*

EDSCI 6018 Learning, Design, and Robotics: Gateway to Critical Thinking
Our robotics laboratory is a fun, engaging course that infuses engineering-based projects into K-12 instruction. We build robots from scratch; learn programming with and without electronics; experiment with simulations; develop media-rich curricula while integrating common core and STEM standards; examine trending issues in Science, Technology, Engineering, Arts and Mathematics (STEAM) education; and discuss the pedagogies that support these approaches. Encouragement of pupils under-represented in STEM K-12 classes is examined. Participants purchase robotic kits in lieu of textbooks. All levels welcome.

EDSCI 6125 Sustainable Engineering
Through the engineering design process, educators will investigate current environmental issues within their local communities and begin to visualize solutions through an interdisciplinary lens of conservation biology, ecology, and social justice. Participation in a virtual classroom design studio will enable educators to better understand the interdependence of disciplines and to apply this understanding to their teaching practice and daily life. *Prerequisites: CNSCI 5100 or EDSCI 5200*