2009 Space Discovery Institute

All courses are experiential, hands-on, and immediately transferable to the classroom. The Space Discovery Institute curriculum focuses on national standards and science, technology, engineering, and mathematics (STEM) principles. Master's Degrees in Curriculum and Instruction with a space studies science emphasis are available.

June 15 – 19 Biological and Physical Research: Human Physiology and Nanotechnology

The life of an astronaut has unique challenges addressed through specialized training and cutting-edge technology. Working in an environment that has nearly no gravity while encountering unseen hazards from solar bombardment to micrometeors makes space exploration for humans the ultimate conquest. Participants will learn the fascinating aspects of how the human body reacts and changes in a microgravity environment. Focus will be on examining how the cardiovascular, muscular, and immunology systems are affected in a prolonged space environment. Participants will experience the effects of microgravity as they perform a variety of simulations, lessons, and activities in a pool environment and a Barany chair. Another aspect of this course will be to study nanomaterials, nanorobotics, and nanosensors and how they impact the ability of humans to survive and work in space.

June 22 – 26 Astronomy Principles for the Classroom: Exploring Our Galaxy

From ancient times to today, humans have attempted to connect their world with that of the heavens. Understanding the physical processes and observational experiences in the world around them facilitates a bridge of learning for those who wish to learn about the universe in which they live. Participants will examine the many fascinating aspects of astronomy as they relates to astrobiology and the development of life on Earth, as well as the possible existence of life elsewhere in the universe. Investigations of extremophile organisms will occur by conducting fieldwork at the Cave of the Winds. The Miller-Urey process and the Drake equation will be explained and investigated as possible theories of how these organisms could exist on other worlds such as Mars, Europa, Enceladus, and Titan. Exploration of current NASA missions will show participants how to discover life on other worlds. Participants will spend an evening stargazing and learning to use a planisphere to view these worlds that may harbor possible life.

July 6 – 10 Space Technologies in the Classroom: Exploring Robotics and Satellites

Even though technology is an ever-increasing part of our daily lives, many people understand little of the sciences behind everyday tasks. The homogenizing of circuit boards, logic chips, and remote sensing is changing the landscape of our society. Participants will learn about the latest space technologies and their application on Earth now and into the future. Through field experiences and hands-on applications, participants will understand the use of satellites and how their use and applications have revolutionized the communications, military, and industry sectors of society. Participants will use the functions of the Global Positioning System (GPS), build their own programmable or maneuverable robot, and go behind the scenes at high-tech facilities that use this technology.

July 13 – 17 Earth Systems Science: Planetary Geology and Ecology

Humans' conquest for knowledge has brought them to the four corners of the Earth in search of answers. As our quest leads us from Earth to the stars, we must understand what shapes and creates the world around us if we are to find life outside Earth. This course enables participants to discover the fascinating processes that form and shape our Earth. Participants will have the opportunity for a unique learning experience in the Garden of the Gods on the ascent to Pikes Peak, and at the Fountain Nature Center. They will perform field work in the Garden and on Pikes Peak using the terrain and geological formations. Participants will also participate in a variety of ecological and water quality studies at the Fountain Nature Center. Through a variety of guided tours, hands-on activities, lesson plans, and knowledgeable instructors, participants will gain a better perspective of their planet and how it functions.

July 13 – 17 Lunar/Mars Exploration and Base Construction

The focus of this course is to demonstrate how to teach all science concepts and standards in one exciting project. Participants of this comprehensive course will learn what it will take to establish and maintain a human presence on the moon and Mars. Advanced life support concepts such as growing food, oxygen and energy production, waste removal and recycling, and exploration of the surface will be discussed. Hands-on activities for each topic will be completed for immediate integration into the classroom. For the final project, participants will design and build a model of a theoretically functioning lunar or Mars base that will be technically sustainable and house astronauts for the exploration of the surface.

July 20 – 24 Rocketry and the Biology of Living in Space: Space History and Space Law

According to the "Vision of Space Exploration," we will send humans back to the moon and on to Mars in the new Orion Crew Exploration Vehicle (CEV). However, dangers await future explorers in the way of microgravity and solar radiation. Participants will learn how scientists are overcoming these obstacles to establish permanent bases on the moon and Mars. Participants will examine the history of flight and the technological advances that led up to space travel and exploration. They will become aware of the connection between the social and political aspects of the "space race" and how this transformed our society. A multitude of hands-on, standards-based classroom activities will be shared with participants along with constructing and launching a variety of rockets, including 3-2-1 pop rockets, 2-Liter water rockets, and Estes' solid fuel rockets. Participants will discover the political implications of launching rockets and other vehicles into space while discovering the fascinating aspects of space law from space lawyers.

Accredited Master's Degree in Space Studies available

For further information, contact
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The Space Foundation reserves the right to alter the program, dates, or speakers at any time.