

UNIVERSITY OF NORTHERN COLORADO

announces the

58th ANNUAL FRONTIERS OF SCIENCE INSTITUTE

APPLICATION INFORMATION/DEADLINE: The priority deadline is March 13, 2017; the extended deadline is May 15, 2017. Colorado student applicants will be *considered for, but not guaranteed*, full or partial scholarship admittance. Students meeting FSI admission qualifications, and not receiving a scholarship, *may be invited to attend as an independent scholar* (responsible for all fees associated with attendance).

WOULD YOU LIKE TO...

- ...spend six weeks immersed in a learning-for-the-thrill-of-learning experiential STEM (science, technology, engineering & mathematics) curriculum?
- ...receive an early introduction to college life and the interactions associated with community living?
- ...experience educational, personal, and social growth with peers who share similar interests?
- ...meet professionals in various STEM fields, become acquainted with STEM career opportunities, and assist with on-site field studies during field trips, industrial tours and seminars?
- ...conduct in-depth scientific research, learn to write a scientific paper, design a scientific poster, develop a website and PowerPoint presentation?
- ...earn UNC college credit and receive a scholarship to attend the University of Northern Colorado?

WHEN? June 18 - July 29, 2017

WHERE? University of Northern Colorado, Greeley, CO

WHO CAN APPLY? *Colorado* students in their sophomore or junior year (10th or 11th grade) of high school.

COST OF FSI PARTICIPATION

The University of Northern Colorado is the host site for the Frontiers of Science Institute that is sponsored by many corporations, foundations, and individuals who elect to promote youth STEM education. Each year, *Colorado student applicants are considered for available scholarships* that may pay all or partial room and board expenses to attend FSI's six-week program. *Scholarship admittance is not guaranteed.*

- Cost of attendance for ***full scholarship recipients*** is a \$1,000 registration fee plus UNC tuition (~\$240), if choosing to take the course for college credit. (partial waivers may be granted due to financial hardship). ***Partial scholarship recipients*** will pay a portion of their room & board, as well as the \$1,000 registration fee and UNC tuition (~\$240, if choosing to take the course for college credit).
- Cost of attendance for ***independent scholars*** is \$3,500 plus UNC tuition (~\$240), if choosing to take the course for college credit. (Payment arrangements are available; the \$1,000 registration fee is waived.)

QUALIFICATIONS:

- A strong interest in and aptitude for STEM (science, technology, engineering, mathematics) subjects, (course emphases vary each year and may be determined by funding).
- A high level of self-discipline, dependability, social maturity, strong work ethic, and positive attitude.
- Good physical health.
- A strong desire to challenge yourself and to engage in STEM investigations. Overnight field trips (with camping) may be scheduled and are **mandatory for each participant**.
- An interest in, and appreciation for differences in people, cultures, and ideas.

HOW DO YOU APPLY?

1. Send an email to lori.ball@unco.edu or call 970.351.2976 with notification of intent to submit an application. Complete the application form found on **the FSI website (www.fsiunc.org)**.
2. Request three letters of recommendation* from each of these individuals:
 - a. A science, technology, or mathematics teacher.
 - b. An English teacher.
 - c. Your guidance counselor.

These letters should provide an evaluation of your ability for *self-directed* work, your ability to work in harmony with others, and your dependability as a member of a social group. **Three (3) letters are required to complete your application.**

3. Request an *official* transcript of your high-school grades, **including grades for the first semester of the current school year**. Also include *available* standardized test scores (PSAT/ACT/SAT).
4. The above materials should be *sent all together* by email (lori.ball@unco.edu) or regular mail to the address listed on page four of this application. *For priority consideration, application materials must be postmarked no later than March 13*. The extended deadline is May 15, 2017.

GOALS OF THE FRONTIERS OF SCIENCE INSTITUTE (FSI)

FSI is designed for high-school sophomores and juniors (rising juniors and seniors) with a strong interest in and aptitude for STEM (science, technology, engineering and mathematics). FSI activities are designed to give students a better understanding of STEM and the nature of scientific investigations. Participants will explore some problems and limitations in STEM and will be encouraged to continue with advanced STEM studies and the eventual pursuit of a STEM career.

It is intended that FSI should produce these results:

- Increase students' understanding of important basic STEM principles and advances at the cutting-edge of science.
- Help students recognize the interdependence and relationships among STEM subjects.
- Help students understand how mathematics and written and oral communications are used to interpret and report STEM research.
- Increase students' understanding of methods of STEM research and provide opportunities to apply those methods in their own investigations.

- Highlight a personal academic pathway for students to realize their highest potential.
- Challenge students through opportunities for critical thinking based on personal experiences and enhance their understanding of the societal impact of STEM progress.
- Build students' understanding of and appreciation for natural resources and diverse environments relation to technology, science, and society.
- Cultivate students' passion for STEM and encourage pursuit of higher education and careers in STEM.

FSI PROGRAM STRUCTURE

FSI's instructional approach is different than that found in most high school classes. The FSI curriculum consists of daily blocks (~105 min each) involving either single discipline instruction or interdisciplinary team teaching, depending on STEM topics considered. Class blocks focusing on STEM usually involve combinations of discussions and laboratory activities emphasizing current topics within each of FSI's listed areas of study. On-campus studies are integrated with fieldwork and tours of industrial, government, or institutional research and production facilities along Colorado's Front Range.

Another component of FSI's varied approach to learning is a series of overnight field trips to the region's representative environmental zones, from South Dakota's Black Hills to the prairies to the Rocky Mountain tundra. A goal of FSI is to extend beyond the scope of high school science curricula and thus explore new, exciting frontiers of science.

FSI students are also engaged in *mentored research* where they are matched with a mentor to complete a focused STEM research project. Most projects fall within the scope of their mentor's current work. Students learn to design experiments, collect and analyze data, and write a scientific research paper, thus building understanding of how mathematics and written and oral communications are used to interpret and report research. Students also prepare posters for display, design multi-media presentations, develop a website, and communicate their research findings and conclusions during formal talks and informal discussions to their peers, faculty, parents, UNC community and FSI sponsors. Through this experience, FSI students learn skills that are valued in business and industry and build contacts for summer internships, as well as future employment opportunities.

Every effort is made to expose FSI students to industrial researchers, professionals in STEM fields, science/mathematics faculty at UNC, and experts from nearby universities. These experts from industry and the STEM community conduct think-tank seminars in many areas. Such interactions clarify current research projects, demonstrate how STEM professionals think and work, and offer insight into STEM related careers. Seminars are offered on topics concerning the relationship of STEM knowledge and research to societal problems and philosophical questions.

Important Note: Each student will participate in *all program activities* (camping trips, evening seminars, industrial visits, research, all STEM classes, and the Open House Poster Session). Therefore, FSI students should be open to broaden their interests and explore all areas of STEM. *No early program dismissal allowed!*

UNC CAMPUS LIFE

Approximately 30-40 students will live in an air-conditioned campus residence hall that is reserved for FSI's exclusive summer use. All students will be assigned an FSI roommate, share meals in campus dining halls, and work in classrooms and laboratories within UNC's Ross Hall located within a short walking distance. Resident

advisors will plan varied evening and weekend activities according to student interests; e.g., recreation center swim and gym, bowling, movies, shopping, etc.

Casual attire is acceptable during the normal class day; however, formal business-like attire is required on most industrial visits and during FSI's Open House Poster Session. More detailed information regarding what to bring will be mailed to each participant upon admittance into the program.

EVALUATION

All students' efforts are evaluated at FSI's conclusion as instructors jointly prepare and write descriptive evaluations. These are retained on file and sent out at the request of each student. Many students ask that these evaluations serve as letters of recommendation for college admission &/or scholarship application.

UNCO COLLEGE CREDIT (optional)

FSI students may earn four UNCO (transferable) college credits upon completion of the full six-week program. A tuition fee of ~\$240 payable directly to UNCO (NOT FSI) will be required of each student who opts to participate in the program for college credit. Students will receive letter grades based on their overall effort (classroom and laboratory participation, research paper, multi-media presentation, poster & website design).

SUPPLEMENTAL UNCO SCHOLARSHIP

In recent years, UNCO has provided \$15,000 annually for the FSI Director to distribute among FSI alumni who select UNC for their higher education. Year and major of study, as well as total number of eligible FSI alumni will determine individual awards each year. Actual award amounts for FSI alumni will be determined at the beginning of each fall semester. Information about other UNCO scholarship programs can be found at www.unco.edu/ofa.

ADDITIONAL INFORMATION

FSI participants are expected to attend the *entire* six-week program. Students will not be admitted who plan to attend other short programs that interrupt their six-week commitment to FSI. No early dismissal allowed.

All students submitting an application will be notified of their status by June 1st. Though most, but not all scholarships are confirmed by this time, FSI will continue to award scholarships as they are confirmed into June.

Students selected to attend the 2017 Frontiers of Science Institute are expected to arrive at UNC on **Sunday afternoon, June 18th**; classes and research commence on Monday, June 19th. Arrival information and other details will be mailed upon formal admission to the Institute.

SUBMIT APPLICATIONS AND ADDRESS ANY QUESTIONS ABOUT FSI TO:

Lori K. Ball, Program Administrator

Frontiers of Science Institute (FSI)

University of Northern Colorado

501 20TH Street – CB 123

Greeley, CO 80639

Daytime phone: 970.351.2976; Cell phone: 970.396.9650

E-Mail address: lori.ball@unco.edu; Website: www.fsiunc.org