Major in Engineering Science

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Engineering Science is an interdisciplinary major that allows students to acquire a strong base in mathematics, the physical sciences, and engineering fundamentals while pursuing a broad background in the liberal arts or other areas of interest in preparation for specialized careers or graduate studies. The major provides comprehensive undergraduate engineering education in selected fields which are not served by traditional engineering programs available at CSU. Three concentrations are available—Engineering Physics, Space Engineering, Teacher Education, and the dual-degree programs in Engineering and the College of Liberal Arts. Regardless of the concentration, graduates are well prepared for a professional career.

Program Educational Objectives

The Engineering Science Program seeks to develop graduates who will be able to do the following within the first few years after graduation:

- Define, analyze, formulate, and synthesize engineering problems associated with their professional position, both independently and in diverse, multidisciplinary and interdisciplinary team environments
- Actively contribute to multifaceted and multidisciplinary projects with significant legal, ethical, regulatory, social, cultural, environmental, and economic considerations using a broad systems perspective
- Communicate effectively with colleagues, professional clients, and the public
- Demonstrate commitment and progress in lifelong learning including further graduate education, professional development including active participation in professional societies, and leadership positions
- Actively participate in innovative and entrepreneurial related projects

Student Learning Outcomes

At graduation, CSU Engineering Science undergraduates are expected to have:

- An ability to apply knowledge of mathematics, science, and engineering
- An ability to design and conduct experiments, as well as to analyze and interpret data
- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability
- An ability to function on multidisciplinary teams
- An ability to identify, formulate, and solve engineering problems
- An ability to understand professional and ethical responsibilities
- An ability to use the techniques, skills, and modern engineering, as well as the tools necessary for engineering practice; and communicate effectively
- The broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context
- A recognition of the need for, and an ability to engage in life-long learning
- Knowledge of contemporary issues
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice

The Engineering Science major and each of its concentrations is accredited by the Engineering Accreditation Commission of ABET (http://abet.org).

Potential Occupations

Engineering Science graduates are well rounded in mathematics, sciences, humanities, and social and behavioral sciences. They are well prepared to enter a career in engineering, or to proceed to graduate school in one of the traditional engineering disciplines. Graduates of the Liberal Arts/Engineering Science dual major often move on to professional programs in medicine, law, veterinary medicine, or business. Moreover, these graduates are suited for a broad range of occupations in addition to engineering. Participation in internships or volunteer activities is highly recommended to enhance practical training and development. Graduates who continue on with advanced studies can attain more responsible positions with the possibility of rising to top professional levels. Some examples include: space engineer, solid-state electronics engineer, and aerospace engineer.

Concentrations

- Engineering Physics Concentration
- Space Engineering Concentration
- Teacher Education Concentration

Dual Degree Programs

See the College of Liberal Arts for information on dual degree opportunities.