Do you want to help improve our planet? Are you curious about ways you can shape your future? If you enjoy science and know how to “do” math, you can become an engineer and make a world of difference. Engineering is about creating things for the benefit of society: from cool new technology to life-saving devices.

Engineers have developed the world's communication, transportation, and building infrastructures, while also making it possible for people to live longer, healthier lives. Clean drinking water, safe food storage, and the protection of our environment are all within the reach of engineers. Engineers design and create very large structures (bridges, roller coasters, buildings) as well as very small things that have big effects. For example, engineers develop complex miniaturized devices, so small they can be implanted in the human body to monitor and treat disease... all thanks to engineers applying the advancement of technology to help improve the world.

What is your dream? Are you inspired to design? To invent? To make a difference? The introduction of the Internet, cell phones and iPods® were all made possible by engineers . . . Think about life-saving medical technologies, such as artificial organs and non-invasive surgery, not to mention the exploration of space from landing on the moon to building an international space station . . . What will be the next frontier? How will you shape your future? Ask an engineer, or better yet, become one, and help make the world a better place!

Engineering Programs at CU-Boulder
http://engineering.colorado.edu/academics

The College of Engineering and Applied Science at CU-Boulder currently has ten accredited engineering degree programs (Computer Science is accredited by the Computing Accreditation Commission of ABET (www.abet.org); all others are accredited by the Engineering Accreditation Commission of ABET):

- Aerospace Engineering Sciences
- Architectural Engineering
- Chemical and Biological Engineering
- Chemical Engineering
- Civil Engineering
- Computer Science
- Electrical Engineering
- Electrical, Computer, and Energy Engineering
- Environmental Engineering
- Mechanical Engineering

Additional degree programs for which accreditation has not been sought:

- Applied Mathematics
- Engineering Physics
- Engineering Management Program (graduate-level only)
- Interdisciplinary Telecommunications Program (graduate-level only)

Other programs offered:

- Center for Advanced Engineering and Technology Education (CAETE) - delivers graduate courses directly to business and industry via live TV broadcast and video
- Colorado Space Grant Consortium - independent study and internship opportunities
- Engineering Honors Program
- Herbst Program of Humanities
- Integrated Teaching and Learning Program and Laboratory (ITLL)
- International Engineering Program - coursework and internship opportunities
Aerospace Engineering

Types of Work
Aerospace engineers design and develop commercial and military aircraft and spacecraft. They develop new technologies for use in commercial aviation, defense systems, and space exploration. Aerospace engineers often specialize in areas such as systems engineering, structural design, navigational guidance and control systems, instrumentation and communications, propulsion systems, computational fluid dynamics, aerodynamics, or production methods. They also may specialize in a particular type of aerospace product, such as commercial transports, passenger planes, helicopters, satellites, or rockets.

Employment
Aerospace engineers work within the aerospace industry. They also work for federal agencies such as the Department of Defense and NASA.

Job Outlook
Aerospace engineers are expected to have an average growth rate with employment projected to increase 7-13% through 2018. New graduates continue to be needed due to the retirement of current aerospace engineers.

Salaries
Average starting salary nationally is $60,620; CU-Boulder graduates with a bachelor’s degree reported an average starting offer of $56,086.

Applied Mathematics

Types of Work
While mathematics is frequently viewed as a separate academic discipline, as a career it is almost always coupled with a specialty or area of application. Applied mathematicians are involved in almost every aspect of business, industry, and education. Depending on their area of specialty, applied mathematicians may work as actuaries, computational scientists, or analysts. They may work on models for the spread of disease, to predict the weather, to improve medical imaging, or to improve a manufacturing process. The careers may differ, but all applied mathematicians have one thing in common -- they are problem solvers.

Employment
Applied mathematicians can be found in almost every area of business and industry, including communications, research and development for manufacturers, the defense industry, engineering and business consulting firms, the finance industry, and education.

Job Outlook
Variable depending upon area of specialty.

Salaries
Average salary is between $45,000 and $60,000, depending upon the graduate's area of specialty.

Architectural Engineering

Types of Work
Architectural engineers design and build facilities that improve our standard of living and quality of life. Architectural engineers solve the problems of energy needs, building systems, urban development, and community planning. Architectural engineers are involved in a wide array of disciplines in the building industry including: structural engineering, illumination and electrical systems engineering, construction engineering, heating, ventilating and air conditioning engineering, and solar heating and cooling design. Architectural engineers are leading users of sophisticated high-tech products, applying the latest computer aided design and analysis techniques, nondestructive testing and measurement, and sensing devices during design, construction, and operation.

Employment
Many individuals with this degree pursue architecture, while others go into the fields of landscape architecture, interior design, planning, and urban design. Additional areas of interest are computer imaging, environmental law, solar design and technology, community development, environmental psychology, and environmental engineering.

Job Outlook
This has been a relatively small occupation in the United States, employing almost one hundred thousand workers. The employment outlook is estimated to show a growth of 7-13% through 2016. Significant growth is expected for
jobs in energy efficiency and renewable technologies of building energy systems.

Salaries
Average salary nationally is $55,265; CU-Boulder graduates with a bachelor's degree reported an average starting offer of $50,923.

Chemical Engineering

Types of Work
Chemical engineers invent, design, and operate manufacturing processes that involve the chemical transformation of raw materials into products that are of value to mankind. Since such processes are often energy-intensive, involve hazardous materials, and produce byproducts and wastes, chemical engineers also work in energy management, safety, pollution prevention, and waste treatment and disposal.

Employment
Chemical engineers are employees across a wide spectrum of industries from traditional chemicals and petroleum-based processes to specialty industries such as pharmaceuticals, biotechnology, and the growing field of alternative energy. Many chemical engineering students continue their studies in graduate, medical, or law school. Chemical engineers often start their careers in larger companies and migrate toward smaller organizations of entrepreneurial nature after a few years. As the process industries take on a global character, chemical engineers are often employed overseas for segments of their careers.

Job Outlook
Chemical engineers are expected to have an employment decline of 2% through 2018. Overall employment in the chemical manufacturing industry is expected to continue to decline, although chemical companies will continue to employ chemical engineers to research and develop new chemicals and more efficient processes to increase output of existing chemicals. However, there will be employment growth for chemical engineers in service-providing industries, such as professional, scientific, and technical services, particularly for research in energy and the developing fields of biotechnology and nanotechnology.

Salaries
Average starting salary nationally is $56,520; CU-Boulder graduates reported an average starting offer of $54,416.

Options at CU-Boulder
As part of their chemical engineering degree program, students may pursue options in bioengineering, environmental engineering, computers, energy, materials science, and microelectronics. There also is a pre-medicine curriculum.

Chemical and Biological Engineering

Types of Work
Chemical and biological engineers use concepts from the biological sciences to inspire and guide the development and production of chemicals, pharmaceuticals, and advanced biomaterials. Exploring the structure of protein molecules, the functioning of cells, and the growth and regeneration of tissues are new frontiers in chemical and biological engineering. These lead to the development of exciting new approaches for drug delivery, biomaterial design, regenerative medicine, and medical devices.

Employment
A degree in chemical and biological engineering prepares you for a professional career in many industries including biotechnology, pharmaceuticals, medicine and biomaterials. Graduates may move into leadership and management positions after a number of years in technical work. This is an attractive program for those students who plan to go on to medical school or graduate school for advanced degrees that lead to careers in research and development.

Job Outlook
Biomedical Engineers are expected to have a much faster than average growth rate with employment projected to increase 72% through 2018.

Salaries
Average starting salary nationally is $49,690 for chemical engineering graduates with a bachelor's degree. CU-Boulder graduates reported an average starting offer of $52,050.

Civil Engineering
Types of Work
Civil engineers design and supervise the construction of roads, bridges, tunnels, buildings, transit systems, dams, airports, irrigation projects-collection and treatment, centers for waste water, and offshore structures. Consulting civil engineers develop designs for new construction projects. Civil engineers in the geotechnical field design projects and evaluate the soils, ground water, and environmental conditions that impact construction.

Employment
Most civil engineers are employed in engineering consulting firms or state or federal governmental agencies. They also are employed in construction, public utilities, transportation, mining, business consulting, software development, and manufacturing.

Job Outlook
Civil Engineers are expected to have a faster than average growth rate with employment projected to increase 24% through 2018.

Salaries
Average salary nationally is $50,560 for civil engineering graduates with a bachelor's degree; CU-Boulder graduates with a bachelor's degree reported an average starting offer of $50,021.

Sub-Disciplines at CU-Boulder

Computer Science
Types of Work
Computer scientists engage in a wide array of tasks that include developing new theories of computation and algorithms, designing new hardware and sensors, developing large software systems, evaluating the utility and usability of software systems and studying the impacts of computing technology on society. In engineering contexts, computer scientists work most often on the hardware and software aspects of system design and tend to emphasize the development of prototypes in an iterative and incremental manner. For more information, visit <http://www.cs.colorado.edu/why>.

Employment
Computer Science graduates have excellent job prospects and are in demand from companies based in many industries including traditional software/hardware companies, but also data processing firms, government agencies, financial institutions, insurance companies, research labs, and universities.

Job Outlook
Computer Scientists are expected to have a much faster than average growth rate with employment projected to increase 24% through 2018.

Salaries
Average starting salary nationally is $57,630; CU-Boulder graduates reported an average starting offer of $63,791.

Electrical Engineering and Electrical & Computer, and Energy Engineering
Types of Work
Electrical, computer, and energy* engineers are found in a huge variety of industries: aerospace; communications, including television, radio, telecommunications, computers, medical instrumentation, bioengineering, optics, data storage, renewable energy, robotics, displays, smart vehicles, automotive, material processing, manufacturing, production and distribution of energy, technical sales, and many more. * “Energy” reflects the new research and teaching directions in the engineering of renewable and sustainable energy systems.

Employment
Electrical Engineering is the largest engineering field. Electrical, computer, and energy engineers work for manufacturers of electrical and electronic equipment, industrial machinery manufacturers, designers of professional and scientific instruments, communications companies and public utilities; manufacturers of aircraft, guided missiles
and unmanned autonomous vehicles; computer and data processing service firms, engineering and business consulting firms, renewable and sustainable energy initiatives and companies, and governmental agencies. The jobs range from CEO, Chief Scientist/Engineer to design engineer to technical sales.

**Job Outlook**

Electrical Engineers and Electrical/Computer Engineers are expected to have a slower than average growth rate with employment projected to be about 2-4% through 2018. Due to the new nature of the added Energy emphasis, there is no data available.

**Salaries**

Average starting salary nationally ranges between 54,030-61,360 for Electrical and Electrical & Computer Engineering; CU-Boulder graduates reported an average starting offer of $58,600 for Electrical Engineering grads and $63,870 for ECEN). Due to the new nature of the added Energy emphasis, there is no data available.

*For more information on the added Energy emphasis, go to [http://ecee.colorado.edu/](http://ecee.colorado.edu/)

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**Engineering Physics**

**Types of Work**

Engineering physics graduates are prepared for exciting research, development and entrepreneurial careers in many frontier areas of engineering including nanotechnology, quantum devices, ultra fast lasers, adaptive optics, cryogenic electronics, computer simulation of physical systems, solar cells, magnetic storage technology, micro-mechanical systems, and molecular electronics.

**Employment**

Approximately half of engineering physics graduates continue on to graduate programs in physics, engineering, and applied sciences. Most find employment opportunities in optics, electronics, magnetics, and other hardware-based job markets.

**Job Outlook**

Job prospects are favorable for physicists in applied research, development, and related technical fields.

**Salaries**

For students who graduate with a bachelor's degree and do not continue on to graduate school, average salary is between $40,000 and $62,000 for those graduates pursuing employment in engineering or information technology sectors, the most dominant fields of employment for this major. Salary information is from the American Institute of Physics.

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**Environmental Engineering**

**Types of Work**

Environmental engineering encompasses the scientific assessment and development of engineering solutions to environmental problems impacting the biosphere, land, water, and air quality. Environmental engineers work on such issues as safe drinking water, wastewater processing, solid and hazardous waste disposal, outdoor air pollution, indoor air pollution and transfer of infectious diseases, human health and ecological risk management, prevention of pollution through product or process design, and renewable and sustainable energy sources.

**Employment**

Environmental engineers can find jobs in every state and internationally. Government agencies at the municipal, state, or federal level need environmental engineers. These agencies include the EPA, which has national and state offices, and various state agencies. There are also many jobs in private corporations, including industrial manufacturers and engineering consulting businesses. Job choices for environmental engineers include research, private practice and consulting, construction, industry, and teaching.

**Job Outlook**

Environmental engineers are expected to have much faster than average growth rate with employment projected to increase 31% or more through 2018.

**Salaries**
Average starting salary nationally is $48,980 for environmental engineering graduates with a bachelor's degree. Sample size from CU-Boulder salary data is too small to be statistically valid.

**Mechanical Engineering**

**Types of Work**
The characteristics which best define mechanical engineering are breadth and flexibility. Mechanical engineering is a core discipline that encompasses the general areas of design and manufacturing, fluid and solid mechanics, and thermal and materials science. Many career directions are open to mechanical engineers. They work in industry, government, and universities, as well as in other professions, including business, law, and medicine.

**Employment**
Most mechanical engineers are employed in a wide range of industries, including automotive, aerospace, chemical, computer, electronic, industrial machinery, manufacturing, mining, oceanographic, petroleum, pharmaceutical, power, printing, publishing, and textile. Mechanical engineers typically engage in one or more of the following: research, development, design, testing, manufacturing, operation and maintenance, and marketing, sales and administration.

**Job Outlook**
Mechanical Engineers are expected to have a slower than average growth rate with employment projected to increase 6% through 2018.

**Salaries**
Average starting salary nationally is $50,550; CU-Boulder graduates with a bachelor's degree reported an average starting offer of $53,129.

CU salary data provided by the Engineering Post-Graduation Survey, 2010

**Engineering Associations**

**Student Societies on Campus**
Association for Computing Machinery
- [www.colorado.edu/engineering/acm](http://www.colorado.edu/engineering/acm)

Architectural Engineering Institute
- [www.aeinstitute.org/](http://www.aeinstitute.org/)

American Institute of Aeronautics and Astronautics
- [www.colorado.edu/StudentGroups/AIAA](http://www.colorado.edu/StudentGroups/AIAA)

Associated General Contractors
- [http://www.agc.org/](http://www.agc.org/)

American Indian Science and Engineering Society
- [http://www.colorado.edu/StudentGroups/AISES/](http://www.colorado.edu/StudentGroups/AISES/)

American Institute of Chemical Engineers
- [www.colorado.edu/che/aiche](http://www.colorado.edu/che/aiche)

American Society of Heating, Refrigerating, and Air-Conditioning Engineers
- [www.ashrae.org/students/](http://www.ashrae.org/students/)

American Society of Mechanical Engineers
- [www.colorado.edu/studentgroups/asme](http://www.colorado.edu/studentgroups/asme)

Biomedical Engineering Society
- [www.colorado.edu/che/BMES](http://www.colorado.edu/che/BMES)

Colorado Engineer Magazine
- [http://cem.colorado.edu/](http://cem.colorado.edu/)

CU Students for the Exploration and Development of Space
- [www.colorado.edu/StudentGroups/CUSED](http://www.colorado.edu/StudentGroups/CUSED)

Engineering Ambassadors
- [http://engineering.colorado.edu/students/engineering_ambassadors.htm](http://engineering.colorado.edu/students/engineering_ambassadors.htm)

Engineers Without Borders
- [http://ceae.colorado.edu/ewbcu/](http://ceae.colorado.edu/ewbcu/)
Illuminating Engineering Society
• www.ceae.colorado.edu/IES

Mexican American Engineers and Scientists/Society of Hispanic Professional Engineers
• www.colorado.edu/StudentGroups/SHPE_MAES

National Society of Black Engineers
• http://ucsu.colorado.edu/~nsbe

Society of Environmental Engineers (SEVEN)
• www.colorado.edu/engineering/EnvEng/SEVEN.htm

Society of Hispanic Professional Engineers and Scientists
• www.colorado.edu/StudentGroups/SHPE_MAES

Society of Industrial and Applied Mathematics
• http://amath.colorado.edu/siam/ (undergrad)
  http://amath.colorado.edu/index.php?page=siam (grad)

Society of Physics Students
• www.colorado.edu/physics/Web/sps

Society of Venture Engineers
• www.colorado.edu/studentgroups/SVE

Society of Women Engineers
• www.colorado.edu/engineering/SWE

Student Alliance of GLBT Engineers
• http://www.facebook.com/groups/130550579845/

University of Colorado Engineering Council
• http://ucec.colorado.edu/main.htm

Honor Societies
Eta Kappa Nu
• http://hkn.colorado.edu/

Sigma Gamma Tau
• www.colorado.edu/studentgroups/sigmagammatau

Tau Beta Pi
• www.tbp.org/

Theta Tau-Eta Gamma
• http://twitter.com/etagamma

National Professional Organizations

Aerospace
American Astronautical Society
• www.aiaa.org

American Institute of Aeronautics and Astronautics
• www.aiaa.org

Aerospace and Electronics Systems Society of the IEEE
• www.ieee-aess.org

Aerospace Industries Association
• www.aia-aerospace.org

Society of Flight Test Engineers
• www.sfte.org

Applied Mathematics
American Mathematical Society/International Mathematics Society
• www.ams.org

American Statistical Association
• www.amstat.org

Association for Women in Mathematics
• www.awm-math.org

Mathematical Association of America
• www.maa.org

Society for Industrial and Applied Mathematics
• www.siam.org

Architectural
American Society of Heating, Refrigerating and Air-Conditioning Engineers
• www.ashrae.org

Architectural Engineering Institute
• http://content.aeinstitute.org/intro.html

Association for Computer Aided Design in Architecture (ACADIA)
• www.acadia.org

International Council for Building Research Studies and Documentation
• www.cibworld.nl

Bioengineering
American Chemical Society
• http://portal.acs.org/portal/acs/corg/content

American Society for Biochemistry and Molecular Biology
The Minerals, Metals and Materials Society
  • www.tms.org

**Mechanical**
American Society of Mechanical Engineering
  • www.asme.org

**Multicultural Engineering Associations**
American Indian Science and Engineering Society
  • www.aises.org

National Society of Black Engineers
  • www.nsbe.org

Society of Hispanic Engineers
  • www.oneshpe.shpe.org/wps/portal/national

Society of Mexican American Engineers and Scientists
  • www.maes-natl.org

**Physics**
American Physical Society
  • www.aps.org

American Institute of Physics
  • www.aip.org

Beyond Boulder
(campus resource for Physics & Astronomy Students)
  • http://beyondboulder.pbworks.com

**Women in Engineering Associations**
Society of Women Engineers
  • www.swe.org

Women in Computing
  • www.gracehopper.org

Women in Engineering
  • www.ieee.org/web/membership/women

**Overall Engineering Resources**
American Council of Engineering companies
  • www.acec.org

American Society for Engineering Education
  • www.asee.org

eGFI
  • http://egfi-k12.org/

EngineerYourLife
  • http://engineeryourlife.org/

National Society of Professional Engineers
  • www.nspe.org

Society of Automotive Engineers
  • www.sae.org

Sloan Career Cornerstone Center
  • www.careercornerstone.org

Try Engineering
  • www.tryengineering.com

**Other Engineering Disciplines**
*(Not offered at CU-Boulder)*
- Agricultural
- Ceramic
- Geological
- Industrial
- Manufacturing
- Materials
- Metallurgical
- Mining
- Naval Architecture and Marine
- Nuclear and Radiological
- Ocean
- Petroleum
- Surveying and Geomatics