

Major Possibilities: Physics



Career Services

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Summary

- The Physics Department serves students planning to follow a career related to physics or another field of science or planning a career in engineering.
- Physics is sometimes referred to as the "liberal arts" degree of technology because physics majors can go on to careers in computer science, engineering, research and development, and biology.
- The starting salaries of engineers are among the highest of all college graduates, according to the Bureau of Labor Statistics.
- In 2006, about 38 % of physicists and astronomers worked for scientific research and development services firms. The Federal Government employed 21 %, mostly in the US Department of Defense, but also in the National Aeronautics and Space Administration (NASA) and in the U.S. Departments of Commerce, Health and Human Services, and Energy.

Physics major synopsis

The Physics Department offers majors and minors for the Bachelor of Science and the Bachelor of Arts degrees. Students wishing to study Engineering are also supported by the department with the 3-2 Engineering Program, whereby they complete introductory courses at Southwestern and then transfer to another university to earn the engineering degree. 3-2 grads also earn a Physical Science degree from Southwestern upon completion of their engineering degree. Physics majors take courses in the earth and the universe, along with other courses in musical acoustics, modern physics, electromagnetism, mechanics, and quantum physics.

Sample occupational areas

Physicists

Physicists explore and identify basic principles and laws governing the motion, energy, structure, and interactions of matter. Most physicists work in research and development. Some do basic research to increase scientific knowledge. Others conduct applied research to build upon the discoveries made through basic research and work to develop new devices, products, and processes. Much physics research is done in small or medium-sized laboratories. However, experiments in plasma, nuclear, and high-energy physics, as well as in some other areas of physics, require extremely large, expensive equipment, such as particle accelerators. Physicists in these subfields often work in large teams. Physicists generally specialize in one of many subfields: elementary particle physics, nuclear physics, atomic and molecular physics, condensed matter physics (solid-state physics), optics, acoustics, space physics, plasma physics, or the physics of fluids. A Ph.D. is required for a career as a physicist.

Engineers

Engineers apply the principles of science and mathematics to develop economical solutions to technical problems. Their work is the link between scientific discoveries and the commercial applications that meet societal and consumer needs. In addition to design and development, many engineers work in testing, production, or maintenance. There are 17 engineering specialties covered in the Federal Government's Standard Occupational Classification (SOC) system. A few of them are aerospace engineers, agricultural engineers, biomedical engineers, chemical engineers, civil engineers, computer hardware engineers, electrical engineers, electronics engineers (except computer), and environmental engineers. Many occupations require a Master's degree.

Computer Scientists

Computer scientists work as theorists, researchers, or inventors. Their jobs are distinguished by the higher level of theoretical expertise and innovation they apply to complex problems and the creation or application of new technology. Computer software engineers apply the principles of computer science and mathematical analysis to the design, development, testing, and evaluation of the software and systems that make computers work. There are two types of computer software engineers. Computer applications software engineers analyze users' needs and design, construct, and maintain general computer applications software or specialized utility programs. Computer systems software engineers coordinate the construction, maintenance, and expansion of an organization's computer systems. A bachelor's degree is usually sufficient, though a master's degree may be preferred for more complex work.

Sample job titles

Industry and Commerce

Animal Breeder
Computer Scientist
Consultant
Contract Administrator
Dietician
Lawyer
Missions Analyst
Nutritionist
Occupational Therapy
Physical Therapy

Power Plant Manager
Resonance Lab Technician
Respiratory Therapy Manager
Satellite Data Analyst

Government, Service & Educ.

Biological Illustrator
Biological Photographer
Consultant for Defense
Contract Companies
Disease Control & Prevention

Media Specialist
Medical Illustrator Military
Officer
National Lab Research
Administrator
Science Writer
Secondary school teacher
University Professor

Research and Technology

Acoustics Physicist

Aerodynamics
Aerospace Nondestructive
Testing Analyst
Astronomer
Astrophysicist
Atomic Physicist
Biophysicist
Chemical Physicist
Geodesist
Geophysicist
Hydrologist

Sample job titles, continued

Lab Tech	Optical Medical Devices	Physicist Researcher	Research and Development
Medical Products Designer	Designer	Radiological Lab Director	Scientist
Meteorologist	Physicist	Research Assistant	Seismologist/Physics Researcher

Sample internship employers of SU students

Abbey Lane INC.	NASA
Abbott Laboratories	REU with NSF Rice Quantum Institute
Brookfield Zoo	<i>Science Magazine</i>
CDS International	<i>Science News</i>
Center for Science in the Public Interest	TxDOT
DuPont	UNT IBMAL Lab
FTWoods Construction	UT Austin Training Reactor Facility
Harvard-Smithsonian Observatory	Zachry Engineering
Nanohmics Inc	

Sample full-time employers of SU grads

Electronic Engineer (Nat'l Bureau of Standards)	Safety Engineer
Engineer (Boeing)	Software Engineer (Northrop Grumman)
Engineer (Steger & Bizzell)	Submarine Officer Nuclear Propulsion -US Navy
Geophysicist (Exxon)	Technical Aide (3M)
Mechanical Engineer (3M)	Pilot (Marines)
Researcher (National Instruments)	

Professional associations

American Association for the Advancement of Science: www.aaas.org
American Society for Biochemistry and Molecular Biology: www.asbmb.org
American Association of Physics Teachers: www.aapt.org
American Institute of Physics: www.aip.org
American Physical Society: www.aps.org
Institute for Mathematics and its Applications: www.ima.umn.edu
Institute of Physics: www.iop.org
International Association of Mathematical Physics: www.iamp.org
International Union of Pure and Applied Physics: www.iupap.org
National Science Teachers Association: www.nsta.org

Additional Web resources

American Institute of Biological Sciences: aibs.org
Careers in Applied Mathematics & Computational Sciences: www.siam.org/careers
Engineering.com: www.engineering.com
Discover Engineering: www.discoverengineering.org
National Science Foundation: www.nsf.gov
NASA: www.nasa.gov
Physicists and Astronomers: www.bls.gov/oco/ocos052.htm
Physics.org: www.physics.org
Physics World: www.physicsworld.com
Science jobs: www.sciencejobs.com

Career Services' print resources

Alternative Careers in Science	Career Opportunities in Forensic Science
Biotechnology Careers	Great Jobs for Engineering Majors
Careers in Engineering	Opportunities in Engineering Careers
Careers in High Tech	Opportunities in Research and Development Careers
Careers in the Environment	Vault Biotech Careers
Career Opportunities in Science	