

Major Possibilities: Physics



Career Services

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Summary

- 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, chemistry, mathematics, and biology.
- The starting salaries of engineers are among the highest of all college graduates, according to the Bureau of Labor Statistics.
- In 2010, about 32% of physicists and astronomers worked in the research and development industry, which include national laboratories in the U.S. Department of Defense, National Aeronautics and Space Administration (NASA), and the U.S. Departments of Commerce, Health and Human Services, and Energy.

Physics major synopsis

Physics is the study of the fundamental principles and laws that govern the physical universe. The Physics Department offers majors and minors for the Bachelor of Science and the Bachelor of Arts degrees; the requirements are identical except that the BS requires one additional physics course plus the remaining BS core courses. Students wishing to study Engineering are also supported by the department through the interdisciplinary Applied Physics major, in which they complete introductory courses at Southwestern and then transfer to another university to earn the 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 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 of these 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

Animal Breeder	Hydrologist	Military Officer	Researcher/Developer
Astronomer	Lab Technician	Missions Analyst	Satellite Data Analyst
Computer Scientist	Law Enforcement Officer	Nutritionist	Seismologist
Consultant	Lawyer	Physical Therapist	Teacher
Contract Administrator	Manufacturing Specialist	Physicist	Technical Support Representative
Engineer	Media Specialist	Power Plant Manager	
Geologist	Medical Illustrator	Product Designer	
Grant Writer	Meteorologist	Quality Engineer	

Sample internship employers of SU students

Abbey Lane INC.
Abbott Laboratories
Brookfield Zoo
CDS International
Center for Science in the Public Interest
DuPont
FTWoods Construction
Harvard-Smithsonian Observatory
Nanohmics Inc.
NASA

REU with NSF
Rice Quantum Institute
Science News
SLAC National Accelerator Lab
TxDOT
UNT IBMAL Lab
UT Austin Training Reactor Facility
Waste Connections
Zachary Engineering

Sample full-time employers of SU grads

Biomedical Flight Controller (Wyle Laboratories)
Controls Engineer Intern (SLAC National Accelerator Laboratory)
Electronic Engineer (Nat'l Bureau of Standards)
Engineer (Boeing, Steger & Bissell)
Geophysicist (Exxon)
Grant Writer (Cinco Solar)
Lab Technician (Boral, Texas Research Institute)
Manufacturing Specialist (Wolfram Manufacturing)
Mechanical Engineer (3M)
Pilot (US Marines)

Process Engineer (Hawker Beechcraft Corporation)
Proposals Specialist (Invensys Operations Management)
Researcher (National Instruments, NM State University)
Sales Manager (Abbey Lane Inc.)
Software Engineer (Northrop Grumman)
Submarine Officer Nuclear Propulsion (US Navy)
Teacher (Desoto Private School)
Technical Aide (3M)
Technology Support Specialist (Southwestern University ITS)

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

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/ooh/life-physical-and-social-science/physicists-and-astronomers.htm
Physics.org: www.physics.org
Physics World: www.physicsworld.com
Science jobs: www.sciencejobs.com
Careers Using Physics: www.physics.purdue.edu/career

Career Services' print resources

2009 Information Technology Jobs in America
Alternative Careers in Science
Careers in Engineering
Careers in High Tech
Careers in Information Technology
Career Opportunities in Agriculture, Food, and Natural Resources
Career Opportunities in Biotechnology and Drug Development
Career Opportunities in the Energy Industry
Career Opportunities in Forensic Science
Career Opportunities in Science
Great Jobs for Engineering Majors

Opportunities in Animal and Pet Careers
Opportunities in Biological Science Careers
Opportunities in Biotechnology Careers
Opportunities in Engineering Careers
Opportunities in Petroleum Careers
Sales and Marketing in the Tech Sector
Scientific Research as a Career
Vault Career Guide to Biotech
Vault Guide to Technology Careers
Winning the Games Scientists Play