

# ENGINEERING

## What can I do with this degree?

### AREAS

### EMPLOYERS

### DESCRIPTIONS/STRATEGIES

#### **ANY ENGINEERING DISCIPLINE**

Production  
Sales and Marketing  
Management  
Consulting  
Research and Development  
Teaching  
Law

Industry  
Business  
Federal, state, and local government  
Colleges and universities

Obtain related experience through co-op or internships for business/industry-related career.  
MBA degree provides best opportunities in technical management.  
Obtain Ph.D. for optimal teaching and research careers.  
Develop strong verbal and written communication skills.  
Learn federal, state, and local government job application procedures.

#### **AEROSPACE**

Propulsion  
Fluid Mechanics  
Thermodynamics  
Structures  
Celestial Mechanics  
Acoustics  
Guidance and Control

Aircraft, guided missile, and space vehicle industries  
Communications equipment manufacturers  
Commercial airlines  
Federal government departments:  
    Defense  
    National Aeronautics and Space Administration (NASA)  
Business and engineering firms

***Discipline uses cutting edge technology to deal with challenges of aeronautics, space, mass transportation, environmental pollution, and medical science.***

Keep abreast of status of federal funding for defense and space programs.  
Seek co-op opportunities.  
Develop effective verbal and written communication skills.  
Learn to work well within a team.

#### **BIOSYSTEMS ENGINEERING**

Natural Resources  
    Soil and Water Conservation  
International Consulting  
Environmental Control  
Agricultural Structures  
Power and Machinery  
Electronic Systems  
Food Engineering  
Genetic Engineering  
Engineering Technology

Technological agricultural industries  
Land grant universities:  
    Experimental farm stations  
    Research laboratories  
Consulting firms  
Equipment design, testing, and manufacturing firms  
Equipment and food industries including processing, packaging, and storing  
Quality control for food, feed, fiber, etc.  
Biotechnology research firms  
Foreign Service

***A broad, basic engineering discipline with a close relationship to the environment, food production, and agricultural productivity.***

Participate in internship or co-op programs.  
Acquire strong computer skills.  
Learn a foreign language for work in foreign service.  
Develop strong math and problem solving skills.

**AREAS**

**EMPLOYERS**

**DESCRIPTIONS/STRATEGIES**

**BIOMEDICAL**

Bioengineering  
Design  
Development  
Manufacturing  
Medical Engineering  
Instrumentation  
Materials  
Diagnostic/Therapeutic Devices  
Artificial Organs  
Medical Equipment  
Rehabilitation Engineering  
Bio-environmental Engineering

Manufacturers of medical and surgical devices  
Hospitals and healthcare facilities  
Federal government:  
Regulatory agencies  
Veteran's Administration  
National Institutes of Health  
National Aeronautics and Space Administration (NASA)  
Industry  
Research facilities of educational and medical institutions

***Discipline combines engineering and human anatomy to develop and maintain medical and healthcare systems and equipment.***

Develop strong team work skills.  
Many positions require a graduate or professional degree.  
Serves as a good background for medical school.

**CHEMICAL**

Administration  
Design and Construction  
Project Engineering  
Control Systems  
Field Engineering  
Process Engineering  
Operations/Production  
Environmental and Waste Management  
Development  
Design

Independent research institutes  
Consulting organizations  
Chemical industry including:  
Agricultural chemicals  
Plastics  
Industrial chemicals  
Petroleum  
Pharmaceutical  
Cosmetic  
Food processing  
Atomic energy development  
Environmental  
Federal government including:  
Department of Energy  
Environmental Protection Agency  
Manufacturing plants including automotive, air plane, paper, microelectronics, textiles, metals, rubber, food, and beverage

***Combines science of chemistry with discipline of engineering to solve problems and develop efficiency.***

Develop exceptional interpersonal skills.  
Acquire technical work experience during college years.

## AREAS

## EMPLOYERS

## DESCRIPTIONS/STRATEGIES

### CIVIL

Structural  
Urban and Community Planning  
Construction  
Environmental  
Water Resources  
Transportation and Pipeline  
Geotechnical  
Photogrammetry, Surveying and Mapping  
Materials

Construction industry  
Engineering or architectural firms  
Utility companies  
Oil companies  
Telecommunications businesses  
Manufacturing companies  
Consulting firms  
Railroads  
State and federal government agencies

***Broad discipline of "doers" providing service to the community through development and improvement. Works extensively with other professionals involved with the community. Provides opportunity to work outdoors.***

Learn to work well within a team.  
Develop strong communication and interpersonal skills.  
Develop physical stamina for outdoor work.  
Get experience in organizing and directing workers and materials.  
Ability to visualize objects in three dimensions is helpful.  
Demand has remained steady due to broad nature of discipline.  
States may require licensing or registration.

### ELECTRICAL/COMPUTER

Power Electronics  
Power Systems  
Communications  
Electronics  
Control Systems  
Digital Signal Processing  
Microelectronics  
Image Processing & Robotics  
Computer Engineering  
Plasma Engineering  
Computer Vision

Manufacturing firms and industry including:  
Aeronautical/Aerospace  
Automotive  
Business machines  
Professional and scientific equipment  
Consumer products  
Chemical and petrochemical  
Computers  
Construction  
Defense  
Electric utilities  
Electronics  
Environmental  
Food and beverage  
Glass, ceramics, and metals  
Machine tools

***A field in touch with a wide and growing range of applications such as high speed and wireless communication, exploration of outer space, and a revolution in medical diagnosis and treatment.***

Develop effective verbal and written communication skills.  
Gain experience in team work.  
Acquire capacity for details.  
Develop interpersonal skills.  
Obtain research experience.

**AREAS**

**EMPLOYERS**

**DESCRIPTIONS/STRATEGIES**

Electrical/Computer, Continued

Mining and metallurgy  
Nuclear  
Oceanography  
Pulp and paper  
Textiles  
Transportation  
Water and wastewater  
Public utilities  
Federal government including:  
Armed forces  
National Aeronautics and Space Administration (NASA)  
National Institutes of Health  
Bureau of Standards  
Department of Defense  
Various commissions  
Consulting firms  
Free-lance consulting

**INDUSTRIAL**

Operations Research  
Applied Behavioral Science  
Systems  
Manufacturing Management  
Information Engineering  
Computer Systems Design and Development

Manufacturing industries  
Accounting firms  
Retail distribution organizations  
Banks and financial institutions  
Hospitals and healthcare organizations  
Educational and public service agencies  
Transportation industries  
Construction industries  
Public utilities  
Electrical and electronics machinery industries  
Consulting firms

***Discipline links management and operations by improving productivity through a "big picture" approach; serves human needs and works with people.***

Take courses in psychology, sociology and anthropology to learn more about people and how they behave.  
Earn an MBA for advancement in management or administration.

## AREAS

## EMPLOYERS

## DESCRIPTIONS/STRATEGIES

### MATERIALS SCIENCE AND ENGINEERING

Metallurgy  
Ceramics  
Plastics/Polymers  
Composites  
Research  
Extractive  
Process  
Applications  
Management  
Sales  
Service  
Consulting

Materials producing companies  
Manufacturing companies including automobiles, appliances, electronics, aerospace equipment, machinery, medicine  
Service companies including airlines, railroads, and utilities  
Consulting firms  
Government agencies:  
    Department of Defense  
    National Aeronautics Space Administration (NASA)  
Research institutes  
Publishers

***Studies properties of various types of materials and how they are made and behave under different conditions.***

Many positions require a graduate degree. Some areas benefited by additional study in business administration, medicine, management and/or law.

Develop good communication skills.  
Gain laboratory and research experience as an undergraduate.

### MECHANICAL

Mechanical Power Generation  
    Internal Combustion Engines  
    Jet Engines  
    Steam Power Plants  
    Rockets  
    Energy Utilization and Conservation  
Thermal/Fluids  
    Thermodynamics  
    Environmental Control  
    Refrigeration  
    Instrumentation and Control  
Machine Sciences  
    Mechanical Design  
    Manufacturing and Production  
    Robotics  
    Operation and Maintenance

Transportation  
    Automotive industry, aerospace industry, military laboratories  
Utilities  
    Steam driven electric power stations  
Equipment Design  
    Plants  
    Nuclear power stations  
Electronics industry  
Petro-Chemical  
    Drilling & production, plant operations  
Manufacturing  
    Consumer products, chemical products, farm equipment, industrial equipment, paper and wood products, textile equipment  
Consulting engineering firms

***Takes broad outlook on solving complex problems. Involves design, development and production. Keeps pace with technology. Acts as an interface between society and technology.***

Obtain related experience through internships or co-op.  
Take additional courses in area(s) of interest.  
Develop strong interpersonal and communication skills.

## AREAS

## EMPLOYERS

## DESCRIPTIONS/STRATEGIES

### ENVIRONMENTAL

Design  
Planning  
Operations  
Administration  
Regulations

Private industry and businesses involved with air pollution control, industrial hygiene, radiation protection, hazardous waste management, toxic materials control, water supply, storm water and wastewater management, solid waste disposal, public health, and land management  
Private engineering consulting firms  
Construction firms  
Research firms  
Testing laboratories  
International organizations

***Discipline plays vital role in reducing toxicity and pollution of water, ground and air for a better quality of life for all living things.***

Consider a master's degree for advancement.  
Foreign language ability beneficial for international work.

### NUCLEAR

Environment and Pollution  
Health  
Space Exploration  
Consumer and Industrial Power  
Food Supply  
Transportation  
Water Supply

Electric and gas utility companies  
Guided missile and space vehicle companies  
Engineering consulting firms  
Business services including medical industry  
Manufacturers of nuclear power equipment  
Research facilities  
Military services  
Defense manufacturers

***Discipline studies basic components of neutrons, protons, electrons and all matter; deals with inanimate substances.***

### ENGINEERING SCIENCE AND MECHANICS

Engineering Mechanics  
Biomedical Engineering  
Computational Mechanics  
Engineering Materials

Industry  
Manufacturing  
Research organizations

***Interdisciplinary program with broad training in engineering science, mathematics, and physical or biological science.***

## **GENERAL INFORMATION**

- Bachelor's degree provides wide range of career opportunities in industry, business, and government.
- Graduate degrees offer more opportunities for career advancement.
- Bachelor's degree is good background for pursuing technical graduate degrees as well as professional degrees in Business Administration, Medicine or Law.
- Related work experience obtained through co-op, internships, part-time or summer jobs, or regular employment is extremely beneficial.
- Develop computer expertise within field.
- Engineers need to think in scientific and mathematical terms, have ability to study data, sort out important facts, solve problems, and be logical thinkers. Creativity is useful.
- Other helpful traits include intellectual curiosity, technical aptitude, perseverance, ability to communicate and work well with others, a commitment to teamwork, and a basic understanding of the economic and environmental context in which engineering is practiced.
- Develop excellent verbal and written communications skills including presentation and technical report writing.
- All states and the District of Columbia require registration of engineers whose work may affect the life, health, or safety of the public.
- Professional or technical societies confer certification in some areas.
- Join related professional organizations.
- Most fields offer overseas opportunities with businesses or government agencies.
- Because of rapid changes in most engineering fields, both continued education and keeping abreast of new developments are very important.
- Most states require an EIT (Engineer-In-Training) test before taking a state examination to become a Professional Engineer (PE).
- Search the Internet for additional information about individual disciplines.