# ENGINEERING
What can I do with this degree?

## AREAS

### ANY DISCIPLINE
- Production
- Sales and Marketing
- Management
- Consulting
- Research and Development
- Teaching
- Law

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

### AEROSPACE
- Propulsion
- Fluid Mechanics
- Thermodynamics
- Structures
- Celestial Mechanics
- Acoustics
- Guidance and Control

## EMPLOYERS

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

## DESCRIPTIONS/STRATEGIES

### ANY DISCIPLINE
- 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.

### AGRICULTURAL
- 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

### AEROSPACE
- 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.
- Acquire team work skills.

**A broad, basic engineering discipline with close relationship to the environment, food production and agricultural productivity.**
- Participate in internships; consider co-op opportunities.
- Master computer skills.
- Learn a foreign language for work in Foreign Service.
- Develop strong math and problem solving skills.
<table>
<thead>
<tr>
<th>AREAS</th>
<th>EMPLOYERS</th>
<th>DESCRIPTIONS/STRATEGIES</th>
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<tbody>
<tr>
<td><strong>BIOMEDICAL</strong></td>
<td></td>
<td>Discipline combines engineering and human anatomy to develop and maintain medical and healthcare systems and equipment.</td>
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<tr>
<td>Bioengineering</td>
<td>Manufacturers of medical and surgical devices</td>
<td>Develop team work skills.</td>
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<tr>
<td>Design</td>
<td>Hospitals and healthcare facilities</td>
<td>Good background for medical school.</td>
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<tr>
<td>Development</td>
<td>Federal government:</td>
<td>Many positions will require graduate or professional degrees.</td>
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<tr>
<td>Manufacturing</td>
<td>- Regulatory agencies</td>
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<tr>
<td>Medical Engineering</td>
<td>- Veteran's Administration</td>
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<tr>
<td>Instrumentation</td>
<td>- National Institutes of Health</td>
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<tr>
<td>Materials</td>
<td>- National Aeronautics and Space Administration (NASA)</td>
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<tr>
<td>Diagnostic/Therapeutic Devices</td>
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<tr>
<td>Artificial Organs</td>
<td>Industry</td>
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<tr>
<td>Medical Equipment</td>
<td>Research facilities of educational and medical institutions</td>
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<tr>
<td>Chemical Engineering</td>
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<tr>
<td>Rehabilitation Engineering</td>
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<tr>
<td>Bio-environmental Engineering</td>
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<tr>
<td><strong>CHEMICAL</strong></td>
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<td>Combines science of chemistry with discipline of engineering to solve problems and develop efficiency.</td>
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<tr>
<td>Administration</td>
<td>Independent research institutes</td>
<td>Develop exceptional interpersonal skills.</td>
</tr>
<tr>
<td>Design and Construction</td>
<td>Consulting organizations</td>
<td>Acquire technical work experience during college years.</td>
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<tr>
<td>Project Engineering</td>
<td>Chemical industry including:</td>
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<tr>
<td>Control Systems</td>
<td>- Agricultural chemicals</td>
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<tr>
<td>Field Engineering</td>
<td>- Plastics</td>
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<tr>
<td>Operations/Production</td>
<td>- Industrial chemicals</td>
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<tr>
<td>Environmental and Waste Management</td>
<td>- Petroleum</td>
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<tr>
<td>Development</td>
<td>- Pharmaceutical</td>
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<tr>
<td>Design</td>
<td>- Cosmetic</td>
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<tr>
<td></td>
<td>- Food processing</td>
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<td></td>
<td>- Atomic energy development</td>
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<td></td>
<td>- Environmental</td>
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<tr>
<td></td>
<td>Federal government including:</td>
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<td></td>
<td>- Department of Energy</td>
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<td></td>
<td>- Environmental Protection Agency</td>
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<td></td>
<td>Manufacturing plants including automotive, air</td>
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<td></td>
<td>- plane, paper, microelectronics, textiles, metals, rubber, food and beverage</td>
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### Areas

<table>
<thead>
<tr>
<th>Civil</th>
<th>Electrical/Electronic</th>
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<tbody>
<tr>
<td>Structural</td>
<td>Manufacturing firms and industry including:</td>
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<tr>
<td>Urban and Community Planning</td>
<td>Aeronautical/Aerospace</td>
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<tr>
<td>Construction</td>
<td>Automotive</td>
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<tr>
<td>Environmental</td>
<td>Business machines</td>
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<tr>
<td>Water Resources</td>
<td>Professional and scientific equipment</td>
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<tr>
<td>Transportation and Pipeline</td>
<td>Consumer products</td>
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<tr>
<td>Geotechnical</td>
<td>Chemical and petrochemical</td>
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<tr>
<td>Photogrammetry, Surveying and Mapping</td>
<td>Computers</td>
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<tr>
<td>Materials</td>
<td>Construction</td>
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<td></td>
<td>Defense</td>
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<td></td>
<td>Electric utilities</td>
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<td>Electronics</td>
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<td>Environmental</td>
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<td>Food and beverage</td>
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<td>Glass, ceramics and metals</td>
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<td>Machine tools</td>
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</table>

### Employers

- Construction industry
- Engineering or architectural firms
- Utility companies
- Oil companies
- Telecommunications businesses
- Manufacturing companies
- Consulting firms
- Railroads
- Utility companies
- Oil companies
- Telecommunications businesses
- Manufacturing companies
- Consulting firms
- Railroads
- 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

### Descriptions/Strategies

**Civil**

- **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 helpful.
- Demand has remained steady due to broad nature of discipline.
- States may require licensing/registration.

**Electrical/Electronic**

- **A field in touch with a wide and growing range of applications such as the “information highway,” exploration of outer space, and a revolution in medical diagnosis and treatment.**

- Develop effective verbal and written communication skills.
- Get experience in working as part of a team.
- Acquire capacity for details.
- Develop interpersonal skills.
- Get involved in research.
Electrical/Electronic, 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

Manufacturing industries
Accounting firms
Retail distribution organizations
Banks and finance organizations
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.

Earn MBA or Ph.D. for advancement in management/administration.
### AREAS

#### MATERIALS SCIENCE AND ENGINEERING

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

#### EMPLOYERS

- 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

#### DESCRIPTIONS/STRATEGIES

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

- Earn graduate degree(s) for many positions due to laboratory environment.
- Some areas benefited by additional study in business administration, medicine, management and/or law.
- Develop good communication skills.

### 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

#### EMPLOYERS

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

#### DESCRIPTIONS/STRATEGIES

**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.
- Take additional courses in area(s) of interest.
- Develop interpersonal skills.
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<td><strong>ENVIRONMENTAL</strong></td>
<td>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&lt;br&gt;Private engineering consulting firms&lt;br&gt;Construction firms&lt;br&gt;Research firms&lt;br&gt;Testing laboratories&lt;br&gt;International organizations, particularly Eastern Europe</td>
<td><em>Discipline plays vital role in reducing toxicity and pollution of water, ground and air for a better quality of life for all living things.</em>&lt;br&gt;Master's degree considered a good investment. Foreign language ability beneficial for international work.</td>
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<td></td>
<td><strong>NUCLEAR</strong>&lt;br&gt;Environment and Pollution&lt;br&gt;Health&lt;br&gt;Space Exploration&lt;br&gt;Consumer and Industrial Power&lt;br&gt;Food Supply&lt;br&gt;Transportation&lt;br&gt;Water Supply</td>
<td><em>Discipline studies basic components of neutrons, protons, electrons and all matter; deals with inanimate substances.</em></td>
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<tr>
<td></td>
<td>Electric and gas utility companies&lt;br&gt;Guided missile and space vehicle companies&lt;br&gt;Engineering consulting firms&lt;br&gt;Business services including medical industry&lt;br&gt;Manufacturers of nuclear power equipment&lt;br&gt;Research facilities&lt;br&gt;Military services&lt;br&gt;Defense manufacturers</td>
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<td></td>
<td><strong>ENGINEERING SCIENCE AND MECHANICS</strong>&lt;br&gt;Engineering Mechanics&lt;br&gt;Biomedical Engineering&lt;br&gt;Computational Mechanics&lt;br&gt;Engineering Materials</td>
<td><em>Interdisciplinary program with broad training in engineering science, mathematics and physical or biological science.</em>&lt;br&gt;Industry&lt;br&gt;Manufacturing&lt;br&gt;Research organizations</td>
</tr>
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</table>
GENERAL INFORMATION

- Bachelor's degree provides wide range of career opportunities in industry, business and government.
- Graduate degrees offer more opportunities for career advancement in business.
- Bachelor's degree is good background for pursuing technical graduate degrees as well as professional degrees in Business Administration, Medicine and Law.
- Related work experience obtained through co-op, internships, part-time or summer jobs, or regular employment extremely beneficial.
- Develop computer expertise within your field.
- Engineers need to think in scientific and mathematical terms; have ability to study data, sort out important facts and solve problems, and be logical thinkers; creativity is useful.
- 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.
- Helpful traits include intellectual curiosity; technical aptitude; ability in mathematics and science; perseverance; willingness to think, work hard and accept responsibility; ability to communicate and work with others with a commitment to teamwork; interest in solving problems, and a basic understanding of the economic and environmental context in which engineering is practiced.
- Most fields offer overseas opportunities through organizations, consulting or government.
- Because of rapid changes in most engineering fields, continued education and keeping abreast of issues is very important.
- Most require an EIT (Engineer-In-Training) test before taking a state examination to become a Professional Engineer (PE).
- Check the World Wide Web for information about separate disciplines.