BIOENGINEERING

What can I do with this major?

AREAS	EMPLOYERS	STRATEGIES

ANY ENGINEERING DISCIPLINE

AREAS

Research and Development
Design
Production
Operations
Management
Teaching
Consulting
Sales and Marketing
Law
Manufacturing
Healthcare

EMPLOYERS

Engineering companies
Consulting companies
Industry
Local, state and federal government
Colleges and universities

STRATEGIES

Obtain relevant experience through co-ops or internships for industry-related career.
Develop strong verbal, written, teamwork and problem-solving skills.
Pursue Master of Science (MS), Master of Engineering (ME), or Master of Business Administration (MBA) degrees for increased opportunities in technical management.
Obtain Ph.D. for teaching and research careers.
Learn federal, state and local government job application procedures.
Pursue Professional Engineering licensure.

BIOPROCESS ENGINEERING

Applying engineering principles to biological processes and materials to develop alternative energy sources, beneficial products, and to provide alternative strategies for dealing with household, agricultural, industrial, and municipal wastes.

AREAS

Biological Materials Processing
- Biodiesel
- Ethanol
- Other alternative energy sources

Processing/Bioseparation of Materials to Produce/Purify
- Pharmaceuticals
- Oils
- Other bio-based products

Treatment System Design/Operation
- Household wastes
- Municipal wastewater
- Solid wastes
- Agricultural wastes

Alternative Materials Production
- i.e. Straw-based fiberboard

EMPLOYERS

Food processing companies
Manufacturing firms
Land grant universities
Research and education facilities
Research laboratories
Government agencies including:
- U.S. and State Departments of Agriculture
- U.S. Forest Service
- U.S. Natural Resource Conservation Service
- U.S. Agricultural Research Service

Alternative fuel production companies
Environmental consulting firms
Power/utilities companies
Pharmaceutical companies
Research firms

STRATEGIES

Seek related production and processing experience through co-ops, internships, or part-time jobs.
Maintain knowledge of current alternative energy and product industry trends and regulations.
Develop strong verbal and written communication skills.
Seek extensive laboratory and research experience to obtain research positions.
Learn team and individual design skills.
Obtain Ph.D. for optimal teaching and research careers.
Become familiar with the federal job application and employment procedures.
Participate in related clubs and organizations like the student chapter of The American Society of Agricultural and Biological Engineers to build contacts and cultivate related interests.

AREAS	EMPLOYERS	STRATEGIES
RESEARCH AND DEVELOPMENT Basic Applied Quality Control Administration Grant Writing	Industry and laboratories: Pharmaceutical Healthcare Agriculture production Food processing and safety Environmental Private research institutions Public health departments State and federal government: National Science Foundation National Institutes of Health Food and Drug Administration Environmental Protection Agency Department of Agriculture Armed Services Department of Homeland Security State and local government laboratories/agencies Colleges and universities	Learn to set up, operate, maintain laboratory instruments and equipment, and monitor experiments. Select courses with laboratory components. Seek research experience with professors. Gain related experience through part-time jobs, internships, or volunteering. Complete a certificate training program, usually one year, to learn specialized laboratory techniques. Take a course in grant writing. A Bachelor's degree in biology qualifies one for laboratory technician or research assistant positions. Earn master's degree for better positions, advancement opportunities, more responsibility and higher pay. Obtain Ph.D. to direct research projects and lead research teams. Maintain a high grade point average and secure strong faculty recommendations to gain admittance into graduate school.
BIOINFORMATICS Algorithm and Statistics Development Data Analysis and Interpretation Information Management Organization and Retrieval	Colleges and universities Private research foundations Independent laboratories: Organic and agricultural chemicals Drug and pharmaceutical Medical device and equipment Research, testing, medical Federal laboratories and regulatory agencies: National Institutes of Health Food and Drug Administration Environmental Protection Agency Department of Agriculture National Biological Information Infrastructure	Develop multiple areas of specialization through coursework, minors, double-majors in molecular biology, mathematics, statistics, computer science, or machine learning. Develop strong programming and database management skills; fluency in several programming languages is helpful. Learn biological software systems. Complete an internship in area of interest. Seek master's degree for increased advancement opportunities.

AREAS	EMPLOYERS	STRATEGIES
LEGISLATION/LAW Lobbying Regulatory Affairs Science Policy Patent Law Environmental Law Nonprofit or Public Interest Mediation	Law firms Corporations State and federal government: Department of Energy Environmental Protection Agency Environmental compliance services companies Regulatory commissions Advocacy organizations	Develop strong research and writing skills. Enhance communication skills through public speaking courses, debate team, or Toast Masters (a public speaking organization). Maintain current knowledge of industry trends, laws and policies specific to area of interest, i.e. environment, food safety, regulatory programs, etc. Acquire internships in federal or state government. Utilize applicable websites and seek assistance from your college career center. Take courses in history, political science and/or legal studies to supplement science curriculum. To pursue a J.D., participate in mock trial and pre-law associations, learn law school admissions process.
BUSINESS/INDUSTRY Technical and Pharmaceutical Sales Management Consulting Marketing	Manufacturing companies: Food/Feed Agricultural chemicals Pharmaceuticals Medical device and equipment Consumer products Marketing firms Consulting firms	Develop excellent communication and interpersonal skills, and demonstrate a high energy level. Take courses in anatomy, pharmacology, and chemistry to supplement curriculum. Consider a business minor. Seek experience through part-time jobs and internships in business; experience in sales may be necessary for some positions. Join related student associations and pursue leadership positions. Be prepared to start in entry level positions, such as management trainee programs. Consider an MBA or Professional Science Master's to advance into higher levels of business management, consulting, research, and brand management.

GENERAL INFORMATION

- Utilize Sloan Career Cornerstone Center's website to learn more about opportunities in engineering.
- A bachelor's degree provides a wide range of career opportunities in industry, business and government.
- Bachelor's degree is good background for pursuing technical graduate degrees as well as professional degrees in Engineering, Business Administration, Medicine or Law.
- Graduate degrees offer more opportunities for career advancement, college or university teaching positions.
- Related work experience obtained through co-op, internships, part-time or summer jobs is extremely beneficial.
- Develop excellent verbal and written communications skills including presentation and technical report writing. Learn to work well on a team to maximize collaborations with other engineers and those outside of the profession.
- Develop computer expertise within field.
- Engineers need to think in scientific and mathematical terms and exhibit the abilities to study data, sort out important facts, solve problems and think logically. Creativity is useful.
- Other helpful traits include intellectual curiosity, technical aptitude, perseverance and a basic understanding of the economic and environmental context in which engineering is practiced.
- Because of rapid changes in most engineering fields, both continued education and keeping abreast of new developments are very important.
- Join relevant professional associations, attend meetings, participate in design competitions and stay up-to-date on research/publications.
- 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.
- Research Fundamentals of Engineering (FE) exam requirements, as this exam is typically the first step in becoming a Professional Engineer (PE).
- Professional Engineer (PE) licensing guidelines vary by state. Check with the National Council of Examiners for Engineering and Surveying (NCEES) for links to state boards.
- Become familiar with the federal job application and employment procedures.

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