What can I do with a major in...
Biomedical engineering

ACTIVITIES BIOMEDICAL ENGINEERING MAJORS DO:
By combining biology and medicine with engineering principles and practices, biomedical engineers develop devices and procedures that solve medical and health-related problems. Many biomedical engineers do research, along with life scientists, chemists, and medical scientists, to develop and evaluate systems and products such as artificial organs, prostheses (artificial devices that replace missing body parts), instrumentation, medical information systems, and health management and care delivery systems. Biomedical engineers also design devices used in various medical procedures, such as the cardiac pacemaker, computers used to analyze blood, laser systems used in corrective eye surgery, and imaging systems such as magnetic resonance imaging (MRI). They develop artificial organs, imaging systems such as ultrasound, and devices for automating insulin injections or controlling body functions. Less well known, but of great importance, are the applications of basic principles to the quantitative modeling and simulation of physiological systems. Some specialties within biomedical engineering include:
- **Bioinstrumentation**: Application of electronics and measurement techniques to develop medical devices.
- **Biomaterials**: Understanding of materials for placement in the human body.
- **Biomechanics**: Study of motion and flow within the body and devices.
- **Cellular, tissue, and genetic engineering**: Development of devices to attack biomedical problems on the microscopic level.
- **Clinical engineering**: Intersection of technology and healthcare.
- **Medical imaging**: Electronic data processing and analysis to display medical images in non-invasive ways.
- **Orthopedic bioengineering**: Understanding of bones, joints, and muscles to design artificial replacements.
- **Rehabilitation engineering**: Improvement of the quality of life for people who have physical and cognitive impairments.
- **Systems physiology**: Understanding of the function of living organisms.

INDUSTRIES BIOMEDICAL ENGINEERING MAJORS WORK IN (SAMPLE LISTING):
Healthcare | Laboratories | Pharmaceuticals | Diagnostics
Biomaterials | Medical software companies | Institutes | Tissue and cellular engineering
Biotechnology | Bio-Instrumentation | Medical imaging | Universities
Invasive devices | Biomechanics | Orthopedics

EMPLOYERS WHO HIRE BIOMEDICAL ENGINEERING MAJORS (SAMPLE LISTING):
Accenture | Heraeus Medical Components | National Instruments | Zimmer Inc.
AMS | Mayo Clinic | St. Jude Medical | Minnetronix
Beckman Coulter | Medical Graphics Corporation | Starkey Hearing Technologies | General Electric
Boston Scientific | Medtronic | Vascular Solutions | Lake Region Medical
Minneapolis VA

TYPES OF POSITIONS FOR BIOMEDICAL ENGINEERING MAJORS (SAMPLE LISTING):
- **Research and development engineer**: Develops new products and improves existing products for groundbreaking medical device equipment.
- **Quality engineer**: Ensures that medical devices meet FDA standards for safety and efficacy.
- **Biomechanical engineer**: Develops mechanical devices such as the artificial hip, heart, and kidney.
- **Manufacturing engineer**: Ensures that medical devices are manufactured in a cost-effective and efficient manner.
- **Sales engineer**: Uses technical expertise to sell products, write technical support documents, and interface between sales staff and design engineers (works directly with scientists, doctors, and engineers).
- **Clinical engineer**: Works directly with doctors to train them on devices.
TYPES OF POSITIONS FOR BIOMEDICAL ENGINEERING MAJORS (Continued):

- **Rehabilitation engineer**: Designs, develops, adapts, tests, evaluates, applies, and distributes technological solutions to problems confronted by individuals with disabilities.
- **Prosthesis designer**: Designs, creates, and fits prosthetic devices such as artificial limbs for patients who have lost limbs or hands.
- **Medical device designer**: Uses technology and research to design new medical devices.

**Some of these positions may require an advanced degree.**

USEFUL WEBSITES FOR BIOMEDICAL ENGINEERING MAJORS:

- Department of Biomedical Engineering: [bme.umn.edu](http://bme.umn.edu)
- Minnesota Biomedical Business Network-MBBNet: [mbbnet.umn.edu](http://mbbnet.umn.edu)
- National Institute of Biomedical Imaging and Bioengineering: [nibib.nih.gov](http://nibib.nih.gov)
- National Science Foundation: [nsf.gov](http://nsf.gov)
- Biomedical Engineer Jobs: [biomedicalengineeringjobs.org](http://biomedicalengineeringjobs.org)

USEFUL WEBSITES FOR ENGINEERING MAJORS:

- Engineer.net: [engineer.net](http://engineer.net)
- Engineer Jobs: [engineerjobs.com](http://engineerjobs.com)
- Engineering Central: [engcen.com](http://engcen.com)
- Graduating Engineer: [graduatingengineer.com](http://graduatingengineer.com)
- ThinkJobs.com: [thinkjobs.com](http://thinkjobs.com)
- Engineering.com: [engineering.com](http://engineering.com)
- Engineer Info: [engineer.info](http://engineer.info)

PROFESSIONAL ORGANIZATIONS:

- Biomedical Engineering Society: [bmes.org](http://bmes.org)
- American Council of Engineering Companies: [acec.org](http://acec.org)
- American Council of Engineering Companies-MN chapter: [acecmn.org](http://acecmn.org)
- National Society of Professional Engineers: [nspe.org](http://nspe.org)
- Minnesota Society of Professional Engineers: [mnspe.org](http://mnspe.org)
- Society of Women Engineers: [swe.org](http://swe.org)

*Additional job/internship search websites and resources can be found at cse.umn.edu/career.

Information on this page was compiled from the Occupational Outlook Handbook, the Encyclopedia of Careers and Vocational Guidance, Biomedical Engineering Careers in BMES Bulletin, Vol. 25, BMES, University of Minnesota.