

# BIOMECHANICS

Have you ever wondered how rehabilitative therapies are developed for stroke survivors? How the latest prosthetic was developed? Or how music can be incorporated to help patients with Parkinson's disease? Explore a degree in Biomechanics!



## WHAT IS BIOMECHANICS?

Biomechanics is the study of the mechanical laws that create human and animal motion. Biomechanics applies principles from engineering, mechanics, physics, and biology to study human and animal movement. There are many different areas of focus for biomechanics research including clinical rehabilitation, cardiovascular mechanobiology, robotics, ergonomics, human performance, prosthetics and orthotics, assistive device development, equipment design, and many more!

Current research in Biomechanics uses tools like motion capture, virtual reality, computer modeling, 3D printing, and advanced manufacturing to explore and understand how humans and animals move. Our faculty work in two main areas Rehabilitative Biomechanics and Cardiovascular Biomechanics.

## DEGREES OFFERED

Bachelor of Science in Biomechanics  
Minor in Biomechanics  
Master of Science in Biomechanics  
PhD in Biomechanics & Kinesiology

## WHAT CAN I DO WITH A DEGREE IN BIOMECHANICS?

With an expertise in both health and physical sciences Biomechanics majors have the ability to pursue a wide variety of careers. These careers range from being technologically centered to human health centered. Students in Biomechanics often pursue careers in:

- Physical and Occupational Therapy\*
- Prosthetics and Orthotics\*
- Medical Device Design
- Clinical Research
- Robotics
- Ergonomics
- Medicine\* (Orthopedics, Cardiology, Neurology)
- Athletic Training\*
- Sports Performance

\*Requires graduate study

Starting salaries in these careers range from \$35,000 to \$145,000.

## REHABILITATIVE BIOMECHANICS

Rehabilitative Biomechanics uses biomechanics to improve the lives of patients with movement disorders, such as Peripheral Artery Disease, Stroke, Parkinson Disease, Chronic Obstructive Pulmonary Disease, Total Knee Arthroplasty, as well as many other conditions. Our faculty:

- Design new therapies and rehab techniques
- Develop assistive devices, including prosthetics
- Create tools to help prevent further health complications related to movement disorders

## CARDIOVASCULAR BIOMECHANICS

Cardiovascular Biomechanics focuses on studying the mechanics of the cardiovascular system to develop devices for patients with Peripheral Artery Disease, cardiac and aortic pathophysiologies, and cardiovascular trauma. Our faculty:

- Design stents to be placed in patients with cardiovascular conditions
- Develop devices to prevent significant blood loss in patients with

## AVAILABLE COURSES

Students have the opportunity to take a wide variety of courses with a biomechanics major including:

- **Biomechanics courses:** Intro to Biomechanics, Analytical Methods, Statics & Dynamics, Bioinspired Robotics, Orthopedic Biomechanics, Neuromechanics, Laboratory
- **General Science courses:** Biology, General Chemistry, Anatomy & Physiology, Physics
- **Other courses:** Calculus, Statistics, Abnormal Psychology

## TRANSFERRABLE SKILLS GAINED

Problem Solving

Interpersonal Communication

Analytical Thinking

Data Analysis

Critical Thinking

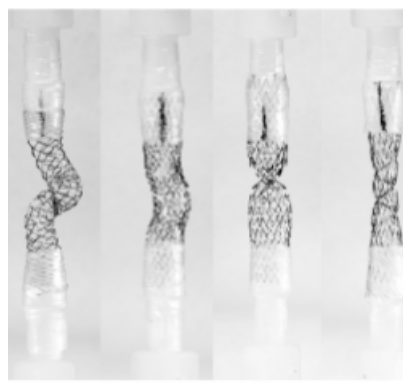
Scientific Writing

Research Design

Teamwork




## INVOLVEMENT OPPORTUNITIES

Biomechanics students can volunteer or work in the laboratories at the Biomechanics Research Building. Students have the opportunity to work with faculty on their current research projects.



### Department of Biomechanics

 Biomechanics Research Building  6001 Dodge Street, Omaha, NE 68182

 [cehhs.unomaha.edu/biomechanics](http://cehhs.unomaha.edu/biomechanics)  [unobiomechanics@unomaha.edu](mailto:unobiomechanics@unomaha.edu)  402.554.3228

The University of Nebraska does not discriminate based on race, color, ethnicity, national origin, sex, pregnancy, sexual orientation, gender identity, religion, disability, age, genetic information, veteran status, marital status, and/or political affiliation in its programs, activities, or employment. UNO is an AA/EEO/ADA institution. For Title IX concerns, please contact the Title IX Coordinator (phone: 402.554.2120). For ADA/504 accommodations or assistance, please call/contact the ADA/504 Coordinator (phone 402.554.2463) or the Accessibility Services Center (phone: 402.554.2872). UCTEMP20

UNIVERSITY OF  
**Nebraska**  
Omaha