# BIOMECHANICS

The mission of the Division of Biomechanics and Research Development is to serve not only the University of Nebraska at Omaha but the entire University of Nebraska system and the state of Nebraska by (a) educating and developing a dynamic workforce to meet our scientific needs at a national and international level and by (b) enhancing economic growth through development of biotechnology and biomechanical intellectual property produced by students and faculty performing innovative research in the multiple laboratories of the Biomechanics Research Building. The research performed in the Division will provide a new understanding of the dynamic aspects of human and animal biomechanics via multidisciplinary approaches. In particular, we aim to achieve the following specific objectives:

- 1. Quantitatively characterize and improve our understanding of the complex biomechanical systems in healthy and abnormal states via innovative analyses.
- Educate and train students, basic scientists, and clinicians, so that they may apply concepts of biomechanics in their careers as educators and researchers.
- Develop new diagnostic and prognostic tests and related biomechanical technology for a variety of movement and cardiovascular disorders and aging.
- 4. Provide biomechanically related services to interested parties and University and community partners.
- 5. Participate in community outreach activities that involve biomechanically related educational opportunities.

Biomechanics is the study of forces that act on the body and the effects they produce. It is an intersection of biology, physiology, anatomy, physics, mathematics, and chemistry. Biomechanics is a rapidly growing discipline that has many applications in robotics, forensics, ergonomics, clinical assessment and rehabilitation of movement disorders, design of prosthetics, sports performance, sports equipment design, safety, etc.

The B.S. in Biomechanics is an excellent choice for students planning to a) pursue graduate education and careers in research, b) work in biomechanically related industry and hospital laboratories, and c) pursue graduate education in professional schools for physical therapy, occupational therapy, medicine and other science-based programs.

The Minor in Biomechanics is ideal for those students who have a major outside of Biomechanics and would benefit from learning the basic principles of Biomechanics.

# **Other Information**

Once students are admitted to the Bachelor of Science in Biomechanics they will be in the College of Education, Health, and Human Sciences and will be required to maintain a cumulative college GPA of 3.0/4.0 scale and grades of "C-" or better in the core courses to remain in good standing in the College of Education, Health, and Human Sciences.

The department highly encourages students to engage in undergraduate research with a faculty mentor. A list of Biomechanics faculty can be found on our website (https://www.unomaha.edu/college-of-education-health-and-human-sciences/biomechanics-core-facility/about-us/directory/). There are also many undergraduate volunteer and student worker opportunities available in the Department.

## **Fast Track Program**

The Department of Biomechanics has developed a Fast Track program for highly qualified and motivated students providing the opportunity to complete a bachelor's degree and a master's degree in an accelerated time frame. With Fast Track, students may count up to 9 graduate hours toward the completion of their undergraduate program as well as the graduate degree program.

#### **Program Specifics:**

- This program is available for undergraduate students pursuing a BS in Biomechanics desiring to pursue a MS in Biomechanics.
- Students must have completed no less than 60 undergraduate hours
- Students must have a minimum undergraduate GPA of 3.0
- Students must complete the Fast Track Approval form and obtain all signatures and submit to the Office of Graduate Studies prior to first enrollment in a graduate course
- Students will work with their undergraduate advisor to register for the graduate courses
- A minimum cumulative GPA of 3.0 is required for graduate coursework to remain in good standing
- Students remain undergraduates until they meet all the requirements for the undergraduate degree and are eligible for all rights and privileges granted undergraduate status including financial aid.
- Near the end of the undergraduate program, formal application to the graduate program is required. The application fee will be waived, the applicant will need to contact the Office of Graduate Studies for a fee waiver code.
  - Admission to Fast Track does NOT guarantee admission to the graduate program.
  - Applicants for this program are highly encouraged to pursue research opportunities in the Department of Biomechanics or comparable programs.
  - The admit term must be after the completion term of the undergraduate degree.

All 8000 level BMCH courses are eligible for students part of the Fast Track program.

#### **Contact Information**

Department of Biomechanics Biomechanics Research Building

402.554.3228

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#### Website (https://www.unomaha.edu/ college-of-education-health-and-humansciences/biomechanics-core-facility/ academic-programs/bsb.php)

## **Degrees Offered**

 Biomechanics, Bachelor of Science (http://catalog.unomaha.edu/ undergraduate/college-education/biomechanics/biomechanics-bs/)

#### **Minors Offered**

- Biomechanics Minor (http://catalog.unomaha.edu/undergraduate/ college-education/biomechanics/biomechanics-minor/)
- Sports Biomechanics Minor (http://catalog.unomaha.edu/ undergraduate/college-education/biomechanics/sports-biomechanicsminor/)

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. Biomechanics majors have the ability to pursue a wide variety of careers. These careers range from being technologically centered to human health centered.

#### Potential career opportunities/settings:

- Physical and Occupational Therapy  $^{\star}$ 
  - Physical Therapist
  - Occupational Therapist
- Prosthetics and Orthotics\*
- Prosthetist
- Medical Device Design
  - Research Scientist
- Clinical Research
  - Gait Analysis Biomechanist
- Robotics
  - Field Application Engineer
  - Robotics Technician
- Ergonomics
  - Ergonomist
- Medicine\* (Orthopedics, Cardiology, Neurology)
  - Orthopedic Surgery
  - Sports Medicine
- Athletic Training\*
  - Athletic Trainer
- Sports Performance
  - Footwear Material Developer
  - Footwear Research and Development

\*Requires graduate study