

BIOMECHANICS, B.S.

Biomechanics is the analysis of human movement to enhance performance, improve training, accelerate rehabilitation, and reduce injury risk. This is done by integrating various mechanical aspects of human movement during static and dynamic activities. The Biomechanics degree applies physics and math principles to study the interactions between humans and various machine systems in both working and living environments. Students will be exposed to specialized equipment to help measure the interaction of humans with their environment. Force plates and accelerometers measure forces generated by various segments of the body and then exerted externally to the body. Muscle activation is measured through electromyography. Motion analysis, using video to create three-dimensional reconstructions, measures body positions, velocities, and accelerations.

The degree in Biomechanics provides students with the background and skills needed to create work and living environments which improve human health and enhance performance. This is a fast growing healthcare related field that is undergoing an increasing demand for this type of specialization. Biomechanical scientists are found in a wide variety of settings, including research and development, universities, sports performance centers, industrial and commercial settings, sports medicine clinics, hospitals, private practice, and the military.


Admission

Admission Criteria

Prospective students must meet the minimum criteria listed below to be considered for admission to the program:




- Admission to Marshall University;
- An overall cumulative minimum GPA of 2.75 to continue in the degree program beyond the sophomore year;
- A C or better in all required coursework;
- Declared Biomechanics as a major, including preferred area of emphasis if applicable.











 - General Education Course

 - Milestone course: a key success marker for your major. See your advisor to discuss the importance of this course in your plan of study.


The Core Curriculum is designed to foster critical thinking skills and introduce students to basic domains of thinking that transcend disciplines. The Core applies to all majors. Information on specific classes in the Core can be found at <https://www.marshall.edu/gened/>.

Course Requirements

Code	Title	Credit Hours
Core Curriculum		
<i>Core 1: Critical Thinking</i>		
FYS 100	First Yr Sem Critical Thinking	3
HS 200  	Comp Medical Terminology (CT)	3
PSY 201 	Introductory Psychology (CT)	3
<i>Core 2</i>		

ENG 101  	Beginning Composition	3
ENG 201 	Advanced Composition	3
CMM 103 	Fund Speech-Communication	3
MTH 132 	Precalculus with Sci Applica	5
BSC 228  	Human Physiology	4
BSC 228L 	Human Physiology Lab	1
Core II Humanities (WI)		3
PSY 201 	Introductory Psychology (CT)	3
Core II Fine Arts		3
MUS 142 	Music in Society (recommended)	

Additional University Requirements

Writing Intensive (WI Sec of Core II Hum)	3	
Writing Intensive	3	
Multicultural or International		
MUS 142 	Music in Society (recommended)	

HS 475	Trends in Biomechanics (Capstone I)	3
HS 495	Trends in Biomechanics II (Capstone II)	3


Major-Specific


BSC 227 	Human Anatomy	4
BSC 227L	Human Anatomy Lab	1
BSC 228  	Human Physiology	4
BSC 228L 	Human Physiology Lab	1
DTS 210	Nutrition	3
ESS 220 	Fitness and Wellness	3
ESS 345 	Exercise Physiology	3
ESS 375 	Fitness Assess & Exerc Prescr	3
STHM 401	Ethics in Sport	3
STHM 410	Leadership: Theory & Practice	3
ESS 442	Princ of Strength & Cond	3
ESS 443	Prin of Strength Cond Lab	1
HS 200  	Comp Medical Terminology (CT)	3
HS 215 	Intro to Athletic Training	3
HS 220	Personal Health	3
HS 222	Hlth Prov First Aid/CPR/AED	3
HS 365	Functional Kinesiology	3
HS 369	Motor Learning	3
HS 435	Biomech Instrument Mat Lab	3
HS 464	Pathomechanics	3
HS 465	Biomechanical Analy of Mvmt	3
HS 475	Trends in Biomechanics (C)	3
HS 495	Trends in Biomechanics II (C)	3
STA 225  	Introductory Statistics (CT)	3
SFT 235  	Intro to Occup Safety (CT)	3
SFT 373	Prin Ergonomics & Hum Factors	3
SFT 373L	Prin of Ergonomics Lab	1
PHY 201  	College Physics I	3
PHY 202 	General Physics I Laboratory	1
PHY 203 	College Physics II	3
PHY 204 	General Physics 2 Laboratory	1
PSY 311 	Child Development	3
PSY 312	Adult Development	3

Free Elective (or Area of Emphasis)	3
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Free Elective	3

Major Information

- Students are required to know and track their degree requirements for graduation or for entrance to a professional school.
- Course offerings and course attributes are subject to change semesters. Please consult each semester's schedule of courses for availability and attributes.
- **Math Requirement:** The biomechanics math requirement is for MTH 132 Precalculus with Sci Applica only (a pre-requisite for Physics 1). Students need an ACT Math score of 24+ to be eligible for MTH 132 Precalculus with Sci Applica. For students with a lower ACT Math score, we allow them to take two courses as an alternative: Algebra (MTH 130 College Algebra with ACT 21+ or MTH 127 College Algebra-Expanded with ACT 17+) and then Trigonometry (MTH 122 Plane Trigonometry) over two semesters.








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Semester Plan






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First Year

First Semester	Credit Hours
FYS 100 First Yr Sem Critical Thinking	3
ENG 101   Beginning Composition	3
HS 200   Comp Medical Terminology (CT)	3
Select one of the following:	3-5
MTH 127  College Algebra-Expanded	
MTH 130  College Algebra	
MTH 132  Precalculus with Sci Applica	
UNI 100 Freshman First Class	1
Credit Hours	13-15

Second Semester







HS 222 Hlth Prov First Aid/CPR/AED	3
Select one of the following:	3
MTH 122  Plane Trigonometry	
Free Elective/Elective ¹	

ENG 201   Advanced Composition	3
BSC 227  Human Anatomy	4
BSC 227L Human Anatomy Lab	1
PSY 201   Introductory Psychology (CT)	3

Credit Hours **17**







Second Year

First Semester

BSC 228   Human Physiology	4
BSC 228L  Human Physiology Lab	1
HS 365 Functional Kinesiology	3
PHY 201  College Physics I	3
PHY 202  General Physics I Laboratory	1
PSY 311  Child Development	3
HS 220 Personal Health	3

Credit Hours **18**





Second Semester

ESS 345  Exercise Physiology	3
PHY 203   College Physics II	3
PHY 204   General Physics 2 Laboratory	1
HS 215 Intro to Athletic Training	3
SFT 235  Intro to Occup Safety (CT)	3
PSY 312 Adult Development	3

Credit Hours **16**


Third Year

First Semester

ESS 375  Fitness Assess & Exerc Prescr	3
STHM 401 Ethics in Sport	3
HS 465 Biomechanical Analy of Mvmt	3
STA 225   Introductory Statistics (CT)	3
Core II Fine Arts	3
MUS 142  Music in Society (recommended)	

Credit Hours **15**

Second Semester

ESS 220  Fitness and Wellness	3
HS 435 Biomech Instrument Mat Lab	3
HS 464 Pathomechanics	3
SFT 373 Prin Ergonomics & Hum Factors	3
SFT 373L Prin of Ergonomics Lab	1
Core II Humanities (WI)	3

Credit Hours **16**

Third Semester


Summer Term (required)

HS 369 Motor Learning	3
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Credit Hours **3**

Fourth Year

First Semester

DTS 210 Nutrition	3
ESS 442 Princ of Strength & Cond	3
ESS 443 Prin of Strength Cond Lab	1
HS 475 Trends in Biomechanics (C)	3
CMM 103  Fund Speech-Communication	3

Free Elective		3
Credit Hours		16
Second Semester		
STHM 410	Leadership: Theory & Practice	3
HS 495	Trends in Biomechanics II (C)	3
Free Elective or Area of Emphasis		3
Free Elective or Area of Emphasis		3
Credit Hours		12
Total Credit Hours		126-128

¹ Free Elective if MTH 132 Precalculus with Sci Applica is completed in Fall

Areas of Emphasis

- Biomechanics Physics, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/health-professions/kinesiology/biomechanics-bs/biomechanics-physics-emphasis/>)
- Biomechanics Pre-Medical, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/health-professions/kinesiology/biomechanics-bs/biomechanics-pre-medical-emphasis/>)
- Biomechanics Pre-Physical Therapy, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/health-professions/kinesiology/biomechanics-bs/biomechanics-pre-physical-therapy-emphasis/>)
- Biomechanics Safety, Emphasis (<http://catalog.marshall.edu/undergraduate/programs-az/health-professions/kinesiology/biomechanics-bs/biomechanics-safety-emphasis/>)