B.A. IN
BIOKINETICS-
EXERCISE SCIENCE
AS A DUAL
DEGREE WITH
M.S. IN ATHLETIC
TRAINING

Requirements for Admission to the Athletic Training Program
A selection process is necessary to identify the most appropriate candidates to enter into the graduate program. A selection committee will evaluate each candidate based on overall GPA, GPA in the prerequisite courses, personal interviews with the selection committee, written application materials, and letters of recommendation.

Matriculation into the M.S. in Athletic Training degree requires a secondary admission process. Once admitted to Bethel University as an undergraduate, students will declare a major in Biokinetics - Exercise Science (B.A.). Students will formally apply to the Athletic Training program early in the spring of their second pre-professional year (i.e., sophomore year). Students who meet the requirements to continue their course of study will progress into the graduate phase of their education after completing their undergraduate courses. Students will submit their formal application through the Graduate School by March 15. Applications will be reviewed and admission decisions will be made by May 1st. Applicants to the Graduate School must meet the following requirements:

- Have earned an undergraduate GPA of 3.0 or higher on a 4.0 scale.
- Complete HAS120; BIO104/BIO104D, BIO120/BIO120D, or BIO122/BIO122D; BIO214/BIO215; CHE113/CHE133D; and HAS325.
- Submit one professional and one supervisor Admission Reference.
- Submit a written Statement of Purpose.
- Complete required Observation Requirements.
- Interview with program faculty.

Admission to the M.S in Athletic Training will be based on the following criteria:
1. Overall undergraduate GPA 3.0 or greater
2. Academic grades in the following courses:
   a. Biology with Lab
   b. Chemistry with Lab
   c. Human Anatomy with Lab
   d. Prevention and Care of Athletic Injuries
3. Program Faculty Interview
4. References

Post-Admissions Process:
Accepted students will receive an official acceptance letter no later than May 1st. Students will receive a checklist to help them complete requirements. All items are due August 1st (prior to the graduate phase of the curriculum):

- Required current certification in either American Red Cross Professional Rescuer CPR or American Heart Association Basic Life Support for Health Care Providers. Copy (with instructor's signature or QR code) of current, valid certification card(s) serves as proof of certification.
- Documentation of the following up-to-date immunizations:
  - Measles/Hepatitis B series
  - Measles/Mumps/Rubella (MMR): (2 dates) Must be given after your first birthday
  - Tetanus shot within the last 10 years
  - Submit a physical examination signed by a licensed medical physician (or designee). Physical Exam must be on Graduate Athletic Training Program Physical Form.
- Signed copy of the M.S. in Athletic Training Technical Standards (with or without reasonable accommodations) form. Compliance with the program’s technical standards alone does not guarantee a student’s eligibility for the BOC certification exam.
- Signed copy of the M.S. in Athletic Training Non-Disclosure Statement.
• Signed copy of the M.S. in Athletic Training Communicable Disease Policy.

Progression/Retention:
Students admitted to the ATP must meet Bethel University requirements for academic progress. In addition, a student must fulfill the following undergraduate and graduate program requirements:

Undergraduate Requirements:
1. Overall cumulative GPA of 3.0 at completion of their undergraduate courses.
2. Earn a grade no lower than C in any major course.

Graduate Requirements:
1. Maintain a cumulative GPA of 3.0.
2. Maintain current certification in American Red Cross CPR/AED for the Professional Rescuer (or equivalent).
3. Become and remain a student member in the National Athletic Trainers Association.
4. Complete clinical requirements as outlined in the ATP Student Manual and the Athletic Training Program webpage.
5. Note: There will be additional expenses (above tuition and fees) associated with clinical rotations. Expenses may include, but are not limited to, personal background check, physical examination and immunizations, professional membership fees, professional conference fees, and uniforms. Each student will have a minimum of one off-campus clinical experience. Transportation is necessary to all off-campus clinical sites. Students must be available nights and weekends for clinical assignments.

B.A. in Biokinetics as a Dual Degree with M.S. in Athletic Training

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>HAS 120</td>
<td>First Aid</td>
<td>1</td>
</tr>
<tr>
<td>HAS 130</td>
<td>Personal and Community Health</td>
<td>3</td>
</tr>
<tr>
<td>HAS 170</td>
<td>Applied Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>HAS 247</td>
<td>Motor Development and Learning</td>
<td>3</td>
</tr>
<tr>
<td>HAS 250M</td>
<td>Statistics and Research Methods in Applied Health Sciences</td>
<td>3</td>
</tr>
<tr>
<td>HAS 325</td>
<td>Prevention and Care of Athletic Injuries</td>
<td>3</td>
</tr>
<tr>
<td>HAS 370</td>
<td>Functional Human Nutrition</td>
<td>3</td>
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<tr>
<td>HAS 375</td>
<td>Biomechanics</td>
<td>3</td>
</tr>
<tr>
<td>HAS 379</td>
<td>Integrative Human Physiology</td>
<td>3</td>
</tr>
<tr>
<td>HAS 393</td>
<td>Literature Review in Biokinetics</td>
<td>1</td>
</tr>
<tr>
<td>HAS 398</td>
<td>Physiological Assessment Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>HAS 399</td>
<td>Physiological Assessment</td>
<td>3</td>
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<td>HAS 440</td>
<td>Advanced Training for Human Performance</td>
<td>3</td>
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Choose from one of the following courses:

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<thead>
<tr>
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<tr>
<td>BIO 104</td>
<td>Human Biology and Human Biology Lab</td>
<td>4</td>
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<tr>
<td>BIO 104D</td>
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<tr>
<td>BIO 120</td>
<td>Introduction to Molecular and Cellular Biology and Introduction to Molecular and Cellular Biology Lab</td>
<td>4</td>
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<tr>
<td>BIO 120D</td>
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<tr>
<td>BIO 122</td>
<td>Introduction to Organismic Biology and Introduction to Organismic Biology Lab</td>
<td>4</td>
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<tr>
<td>BIO 122D</td>
<td></td>
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</tr>
<tr>
<td>BIO 214</td>
<td>Human Anatomy and Human Anatomy Lab</td>
<td>4</td>
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<tr>
<td>BIO 215</td>
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<tr>
<td>BIO 216</td>
<td>Human Physiology and Human Physiology Lab</td>
<td>4</td>
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<tr>
<td>BIO 217</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CHE 113</td>
<td>General Chemistry I and General Chemistry I Lab</td>
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<td>CHE 113D</td>
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<tbody>
<tr>
<td>PHY 102</td>
<td>Physics of Everyday Life and Physics of Everyday Life-Lab</td>
<td>4</td>
</tr>
<tr>
<td>PHY 102D</td>
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B.A. in Biokinetics-Exercise Science as a Dual Degree with M.S. in Athletic Training

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>PHY 202</td>
<td>Introductory Physics I</td>
<td></td>
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<tr>
<td>&amp; PHY 202D</td>
<td>and Introductory Physics I Lab</td>
<td></td>
</tr>
<tr>
<td>PSY 100</td>
<td>Introduction to Psychology</td>
<td>3</td>
</tr>
</tbody>
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Code | Title | Credits |
---|-------|---------|
Major | | 56 |
General Education | | 49-50 |
Courses from Bethel’s M.S. in Athletic Training | | 57 |

Total Credits: 162-163

1 Students will receive a B.A degree, in Biokinetics as a dual degree that will be granted only upon completion of the M.S. in Athletic Training. Specific courses and descriptions can be found in the Bethel University Graduate Catalog.

Courses whose number is followed by a letter fulfill a General Education requirement.

The Bethel University Athletic Training Program (ATP) is accredited by the Commission on Accreditation of Athletic Training Education Programs (CAATE), www.caate.org and is designed to prepare students for the Board of Certification (BOC) exam and for careers as certified athletic trainers.

This option represents a collaborative partnership between the College of Arts and Sciences (CAS) and the Graduate School (GS) at Bethel University. Students wishing to complete the 3 + 2 program will adhere to the following plan:

1. Enroll in the B.A. in Biokinetics-Exercise Science.
2. In the first three years of their undergraduate program, complete undergraduate courses, including all general education courses prior to enrolling in graduate courses.
3. Apply and be accepted into the M.S. in Athletic Training program.
4. Begin the M.S. in Athletic Training in their fourth year.
5. Upon successful completion of all requirements for both degrees, the student will earn both a B.A. in Biokinetics-Exercise Science and a M.S. in Athletic Training. Neither degree will be awarded without completion of all requirements for both degrees. The B.A. in Biokinetics-Exercise Science will be awarded by the College of Arts & Science. The M.S. in Athletic Training will be awarded by the Graduate School.

6. Students planning to complete the five-year course of study in athletic training will apply for early-admissions to the Graduate Athletic Training Program (ATP) in the spring semester of their second year. Students who are not accepted or have not yet met the admission requirements may apply in their third year. **Student may not graduate with the athletic training master’s degree without completing all clinical requirements for the ATP.**

**BIO 100 • Principles of Biology** 3 Credits.
Basic principles of modern biology. Topics include the scientific method, biology of the cell, genetic principles, anatomy and physiology of humans, plant biology, and environmental biology. Corequisites: Registration in BIO 100D is required. Offered: Occasionally.

**BIO 100D • Principles of Biology Lab** 1 Credit.
Laboratory experience accompanying BIO 100. Corequisites: Registration in BIO 100 is required. Offered: Occasionally.

**BIO 104 • Human Biology** 3 Credits.
Study of the biological aspects of the human species. Includes basic molecules of life, human cell biology, tissue types, anatomy and physiology of the 10 systems, human embryology and development, human genetics, nutrition, disease, and health. Corequisites: Registration in BIO 104D is required. Offered: Fall, Spring.

**BIO 104D • Human Biology Lab** 1 Credit.
Laboratory experience accompanying BIO 104. Corequisites: Registration in BIO 104 is required. Offered: Fall, Spring.

**BIO 105 • Medical Terminology** 2 Credits.
Study of medical terms. Students study material independently and take proctored examination to demonstrate knowledge of medical language. Prerequisites: Permission of instructor. Offered: Fall, Spring.
BIO 114D • Introduction to Biodiversity, Ecology, and Adaptation 4 Credits.
An introduction to the diversity, interrelationships, and origins of living organisms. Focuses on three themes: an overview of kinds and diversity of organisms found in six kingdoms, the interaction of organisms with each other and their environment, and the change of organisms through time.
Offered: Occasionally.

BIO 120 • Introduction to Molecular and Cellular Biology 3 Credits.
An introduction to cellular and subcellular aspects of living organisms. Includes a study of basic chemistry, biological molecules, cells, enzymes, metabolism, classical genetics, and molecular genetics.
Corequisites: Registration in BIO 120D is required. Offered: Fall, Spring. Special Notes: This course is intended for Nursing and other science related majors.

BIO 120D • Introduction to Molecular and Cellular Biology Lab 1 Credit.
Laboratory experience accompanying BIO 120. Corequisites: Registration in BIO 120 is required. Offered: Fall, Spring.

BIO 122 • Introduction to Organismic Biology 3 Credits.
An introduction to how living things work. Focuses on two main themes: the correlation between structure and function, and the capacity of organisms to adjust their internal environment in response to short-term and long-term fluctuations in the external environment.
Corequisites: Registration in BIO 122D is required. Offered: Fall, Spring.

BIO 122D • Introduction to Organismic Biology Lab 1 Credit.
Laboratory experience accompanying BIO 122. Corequisites: Registration in BIO 122 is required. Offered: Fall, Spring.

BIO 124 • Integrative Biology: Genes, Cells, Change 3 Credits.
In a complex world, understanding challenges like infectious disease or environmental change requires a fundamental knowledge of biology. Using relevant examples, students will explore molecules, DNA, biotechnology, evolution, populations, ecosystems, disease, and human systems (e.g. digestive, immune) to gain a perspective on global health and personal responsibility to life.
Prerequisites: Declared major in Biology, Environmental Science, Environmental Studies, Biochemistry/Molecular Biology, Neuroscience, or Secondary Education Life Science OR a declared minor in Biology. Corequisites: BIO 124D. Offered: Fall, Spring.

BIO 124D • Integrative Biology: Genes, Cells, Change Lab 1 Credit.
Laboratory experience accompanying BIO 124. Corequisites: BIO 124. Offered: Fall, Spring.

BIO 126 • Integrative Biology and Global Health 3 Credits.
Cancer. Climate change. Infectious disease. These are some of the challenges before biologists; challenges that require knowledge and skills that are not confined to one sub-discipline to solve. Through real world, case-based problems encompassing cells to ecosystems, this course unpacks what it means to be a biologist today. Concepts include genetics, evolution, population, community and ecosystem ecology and global change.
Corequisites: Registration in BIO 127 is required. Offered: Fall.

BIO 127 • Integrative Biology and Global Health Lab 1 Credit.
Laboratory experience accompanying BIO 126. Corequisites: Registration in BIO 126 is required. Offered: Fall.
BIO 128 • Integrative Biology: Metabolism, Energy, Biodiversity 3 Credits.
Living organisms face challenges requiring them to either adapt, move, acclimate or perish. Through real-world examples, students will gain a fundamental understanding of homeostasis, enzymes, metabolism, energy flow, movement, human systems (e.g., circulatory, nervous, excretory), photosynthesis, cellular respiration, extinction, biodiversity, transformation of matter and acclimation. 
Prerequisites: Declared major in Biology, Environmental Science, Environmental Studies, Biochemistry/Molecular Biology, Neuroscience, or Secondary Education: Life Science OR Declared minor in Biology. Corequisites: Concurrent registration in BIO 128D is required. Offered: Fall, Spring.

BIO 128D • Integrative Biology: Metabolism, Energy, Biodiversity Lab 1 Credit.
Laboratory experience accompanying BIO 128. Corequisites: BIO 128. Offered: Fall, Spring.

BIO 130 • Introduction to Neuroscience 3 Credits.
An introduction to the biological basis of behavior. Focuses on two main themes: the cellular, molecular, and genetic processes that form the foundation of nervous system function and the systems-level organization of the nervous system that forms the foundation of human and animal behavior. 
Corequisites: Registration in BIO 130D is required. Offered: Spring. Special Notes: Carries cross-credit in Psychology and Neuroscience.

BIO 130D • Introduction to Neuroscience Lab 1 Credit.
Laboratory experience accompanying BIO 130. Corequisites: Registration in BIO 130 is required. Offered: Spring. Special Notes: Carries cross credit with Neuroscience and Psychology.

BIO 132 • The Science of Birds 3 Credits.
An overview of the Minnesota avifauna and bird biology. Bird identification is discussed and practiced in the field. Selected topics from bird biology (migration, flight, reproduction, behavior, food, and conservation) are presented through lectures, numerous slide shows, and videos. These topics provide an introduction to the prevailing themes in modern biology. 
Corequisites: Registration in BIO 132D is required. Offered: Occasionally Spring.

BIO 132D • The Science of Birds Lab 1 Credit.
Laboratory experience accompanying BIO 132. Corequisites: Registration in BIO 132 is required. Offered: Occasionally Spring.

BIO 214 • Human Anatomy 3 Credits.
Detailed study of the anatomy and histology of the human body in relation to its functional systems. Laboratory includes human cadaver dissections. 
Prerequisites: One of the following: BIO 104/104D, BIO 120/120D, BIO 122/122D, BIO 124/124D, BIO 128/128D. Corequisites: Registration in BIO 215 is required. Special Notes: Not open to students who have taken BIO 238/239 except by department consent. Offered: Fall.

BIO 215 • Human Anatomy Lab 1 Credit.
Laboratory experience accompanying BIO 214. Corequisites: Registration in BIO 214 is required. Offered: Fall.

BIO 216 • Human Physiology 3 Credits.
Integration of basic principles of cell biology and mechanisms of physiology to the functions of the major organ systems of the human body; centered around the theme of homeostasis. 
Prerequisites: BIO 214/215; One of the following: BIO 104/104D, BIO 120/120D, BIO 218. Corequisites: Registration in BIO 217 is required. Special Notes: Not open to students who have taken BIO 238/239 except by department consent and a course in chemistry is a recommended prerequisite. Offered: Spring.

BIO 217 • Human Physiology Lab 1 Credit.
Laboratory experience accompanying BIO 216. Corequisites: Registration in BIO 216 is required. Offered: Spring.

BIO 218 • Biology in a Changing World 3 Credits.
Through the exploration of interactions between genes and their environments, students articulate integrative topics (e.g., evolution, transformation of matter, and energy, information flow, systems and structure/function), identify career options and desired skill sets, make a growth plan and articulate an intellectual autobiography, including faith integration. 
Prerequisites: BIO 124/124D; BIO 128/128D. Offered: Fall, Spring.
BIO 234 • Microbiology 3 Credits.
Microorganisms and viruses with respect to their structure, physiology, genetics, identification, control, host-microbe relationships, and exploitation by humans. Topics include pathogenic organisms, the infectious diseases they cause, and the events and products of vertebrate immune responses.
Prerequisites: One of the following: BIO 218 (may be taken concurrently), BIO 120/120D; One course in chemistry (A second course in chemistry is recommended). Corequisites: Registration in BIO 235 is required. Offered: Spring.

BIO 235 • Microbiology Lab 1 Credit.
Laboratory experience accompanying BIO 234. Corequisites: Registration in BIO 234 is required. Offered: Spring.

BIO 238 • Human Anatomy and Physiology 3 Credits.
Anatomy and physiology of the human body, with a major emphasis on the principle of homeostasis.
Prerequisites: One of the following: BIO 104/104D, BIO 122/122D, BIO 218, (may be taken concurrently). Corequisites: Registration in BIO 239 is required. Special Notes: A course in chemistry is a recommended prerequisite. Not open to students who have taken BIO 214/215, BIO 216/217. Offered: Spring.

BIO 239 • Human Anatomy and Physiology Lab 1 Credit.
Laboratory experience accompanying BIO 238. Corequisites: Registration in BIO 238 is required. Offered: Spring.

BIO 244 • Pathophysiology and Pharmacology 3 Credits.
An integrated exploration of disease processes and the drugs used to treat them. The functional and structural changes that accompany a particular injury, disease, or syndrome are correlated with the study of drugs and their actions on the body.
Prerequisites: BIO 214/215; BIO 216/217 (may be taken concurrently); BIO 218, (may be taken concurrently); two semesters of Chemistry. Corequisites: Registration in BIO 245 is required. Offered: Spring.

BIO 245 • Pathophysiology and Pharmacology Lab 1 Credit.
Laboratory experience accompanying BIO 244. Corequisites: Registration in BIO 244 is required. Offered: Spring.

BIO 248 • Clinical Pathophysiology and Pharmacology 3 Credits.
An integrated exploration of disease processes and the drugs used to treat them. The functional and structural changes that accompany a particular injury, disease, or syndrome are correlated with the study of drugs and their actions on the body.
Prerequisites: Acceptance into the Nursing program or consent of instructor. Corequisites: Registration in BIO 249 is required. Offered: Spring. Special Notes: Not open to students who have taken BIO 244/245.

BIO 249 • Clinical Pathophysiology and Pharmacology Lab 1 Credit.
Laboratory experience accompanying BIO 248. Corequisites: Registration in BIO 248 is required. Offered: Spring.

BIO 316 • Wildlife Ecology and Management 3 Credits.
Analysis of terrestrial vertebrate populations, communities, and habitats. Exploration of how these analyses are applied to the manipulation, exploitation, protection, and restoration of animal populations and communities.
Prerequisites: Two of BIO 212/122D, BIO 128/128D, ENS 104/104D; Junior or senior standing. Corequisites: Concurrent registration in BIO 317 is required. Special Notes: Carries cross-credit in environmental science. Offered: Spring, even # years.

BIO 317 • Wildlife Ecology and Management Lab 1 Credit.
Laboratory experience accompanying BIO 316. Includes some outdoor and off-campus investigations. Corequisites: Registration in BIO 316 is required. Offered: Spring, even # years.

BIO 318KZ • Ecology in the Tropics: Natural History and Future Prospects 4 Credits.
Travel in Kenya or Ecuador surveying the land, climate, plants, animals, homes, transportation, and industries, noting especially the impact of human presence. Ecuador includes the Amazon rainforest, Andean cloud forests, volcanic mountains, highlands, towns, cities, and the Galapagos Islands. Kenya includes Nairobi, African savanna, the Rift valley, and Masai Mara.
Prerequisites: Laboratory Science (D) course; Mathematics (M) course. Offered: Interim. Special Notes: Carries cross-credit in environmental science and general studies.
BIO 324 • Human Ecology 3 Credits.
Interrelationships between humans and the natural environment. Overpopulation, resource use, and pollution studied from biological, social, and economic standpoints, and skill development in the critical examination of the impacts of humans and our technology on the natural world. 
Prerequisites: One year of Chemistry; BIO 218 (may be taken concurrently) or both BIO 122/122D and ENS 104/104D; Junior or senior standing. 
Corequisites: Registration in BIO 325 is required. Offered: Occasionally.

BIO 325 • Human Ecology Lab 1 Credit.
Laboratory experience accompanying BIO 324. 
Corequisites: Registration in BIO 324 is required. Offered: Occasionally.

BIO 326 • Vertebrate Histology 3 Credits.
Microscopic structure of cells, tissues, and organs in vertebrate animals, with special emphasis on the way structural units are integrated. At all times efforts are made to correlate structure with specific physiological functions. 
Prerequisites: BIO 218. Corequisites: Registration in BIO 327 is required. Offered: Spring, odd # years.

BIO 327 • Vertebrate Histology Lab 1 Credit.
Laboratory experience accompanying BIO 326. 
Corequisites: Registration in BIO 326 is required. Offered: Spring, odd # years.

BIO 328 • Invertebrate Biology 3 Credits.
A survey of invertebrate groups from protozoa to prochordates with emphasis on organizational, functional, and ecological significance. Special attention is given to the morphology, life histories, and physiology of invertebrates within the context of survival in specialized environments. 
Prerequisites: BIO 218 (may be taken concurrently) or two of the following: BIO 122/122D, BIO 128/128D, ENS 104/104D. Corequisites: Registration in BIO 329 is required. Offered: Spring, odd # years.

BIO 329 • Invertebrate Biology Lab 1 Credit.
Laboratory experience accompanying BIO 328. 
Corequisites: Registration in BIO 328 is required. Offered: Spring, odd # years.

BIO 330 • Ecology 3 Credits.
Structure and function of wild nature. Topics include interrelationships of organisms with their environments, factors that regulate such interrelationships, and various roles that humans play in modifying patterns and processes of nature at organism, community, and ecosystem levels. 
Prerequisites: BIO 218 (may be taken concurrently) or two of the following: BIO 122/122D, BIO 126/127, BIO 128/128D, ENS 104/104D. Corequisites: Registration in BIO 331 is required. Special Notes: This is a designated research course. Offered: Fall, odd # years.

BIO 331 • Ecology Lab 1 Credit.
Laboratory experience accompanying BIO 330. 
Corequisites: Registration in BIO 330 is required. Offered: Fall, odd # years. Special Notes: This is a designated research course.

BIO 332 • Genetics 3 Credits.
Principles that control inheritance, with examples chosen from plant and animal research, population genetics, cytogenetics, molecular genetics, and current work on human genetics. 
Prerequisites: BIO 218 (may be taken concurrently) or BIO 120/120D; Two courses in chemistry. 
Corequisites: Registration in BIO 333 is required. Offered: Fall.

BIO 333 • Genetics Lab 1 Credit.
Laboratory experience accompanying BIO 332. 
Corequisites: Registration in BIO 332 is required. Offered: Fall.

BIO 336 • Entomology and Parasitology 3 Credits.
A comparative study of the major invertebrate groups from anatomical, physiological, and ecological perspectives with attention to insects and parasitic invertebrates. 
Prerequisites: BIO 218 (may be taken concurrently) or two of the following: BIO 122/122D, BIO 126/127, BIO 128/128D, ENS 104/104D; Junior or senior standing. Corequisites: Registration in BIO 337 is required. Offered: Occasionally.

BIO 337 • Entomology and Parasitology Lab 1 Credit.
Laboratory experience accompanying BIO 336. 
Corequisites: Registration in BIO 336 is required. Offered: Occasionally.
BIO 338 • Endocrinology 3 Credits.
Processes by which hormones exert control over many aspects of reproduction, development, growth, metabolism, and behavior. Topics include the chemical nature of hormones, receptors and signaling pathways, morphology and histology of endocrine organs, regulation of hormone synthesis and secretion, and mechanism of action in target tissues.
Prerequisites: BIO 218 (may be taken concurrently) or BIO/NSC/PSY 130/130D; BIO 120/120D; BIO 122/122D. Corequisites: Registration in BIO 339 is required. Offered: Fall, even # years. Special Notes: A course in physiology is a recommended prerequisite.

BIO 339 • Endocrinology Lab 1 Credit.
Laboratory experience accompanying BIO 338. Work is largely experimental, using bioassay procedures.
Corequisites: Registration in BIO 338 is required. Offered: Fall, even # years.

BIO 342 • Aquatic Biology 3 Credits.
Biological and physical aspects of natural, freshwater ecosystems, including fish and other aquatic animals, aquatic plants, algae, and their interrelationships with each other and the unique aqueous environment in which they live.
Prerequisites: BIO 218 (may be taken concurrently) or two of the following: BIO 122/122D, BIO 128/128D, ENS 104/104D. Corequisites: Registration in BIO 343 is required. Offered: Fall, even # years.

BIO 343 • Aquatic Biology Lab 1 Credit.
Laboratory experience accompanying BIO 342. Includes some outdoor and off-campus investigations.
Corequisites: Registration in BIO 342 is required. Offered: Fall, even # years.

BIO 346 • Animal Behavior 3 Credits.
Behavior from primitive invertebrates to advanced mammals, highlighting trends in behavior systems. Natural setting studies in the ethology tradition, comparative psychology studies, and biosociological principles with their implications for human social systems.
Prerequisites: PSY 100 or BIO 218 (may be taken concurrently); Junior or senior standing. Corequisites: Registration in BIO 347 is required. Special Notes: Carries cross-credit in psychology. Offered: Fall, even # years.

BIO 347 • Animal Behavior Lab 1 Credit.
Laboratory experience accompanying BIO 346. Corequisites: Registration in BIO 346 is required. Offered: Fall, even # years.

BIO 354 • Cell Biology 3 Credits.
The molecular organization and function of cells and their organelles. Understanding how cell biology information is obtained experimentally.
Prerequisites: Two courses in Chemistry (CHE 224 recommended); BIO 218 (may be taken concurrently) or BIO 332/333 or both PSY 100 and BIO/PSY/NSC 130/130D. Corequisites: Registration in BIO 355 is required. Special Notes: This is a designated research course. Offered: Spring.

BIO 355 • Cell Biology Lab 1 Credit.
Laboratory experience accompanying BIO 354. Corequisites: Registration in BIO 354 is required. Offered: Spring. Special Notes: This is a designated research course.

BIO 358 • Neurobiology 3 Credits.
Nervous system of animals and humans. Includes comparative anatomy and physiology of humans with other vertebrates and invertebrates, as well as interactions of sensory, motor, and integrative mechanisms of nervous system control.
Prerequisites: BIO 218 (may be taken concurrently) or PSY 100 and BIO/NSC/PSY 130/130D; Junior or senior standing. Corequisites: Registration in BIO 359 is required. Offered: Fall, even # years.

BIO 359 • Neurobiology Lab 1 Credit.
Laboratory experience accompanying BIO 358. Corequisites: Registration in BIO 358 is required. Offered: Fall, even # years.

BIO 362 • Developmental Biology 3 Credits.
The basic question of developmental biology is “How does a single fertilized egg give rise to all the different cell, tissue, and organ types of the adult organism?” The developmental processes that give rise to these different cell, organ, and tissue types along with the mechanisms underlying those processes are studied at the cellular, genetic, molecular, and biochemical levels.
Prerequisites: BIO 120/120D or BIO 124/124D; BIO 218 (may be taken concurrently) or 8 credits of BIO courses not including BIO 124/124D and BIO 128/128D; Two courses in chemistry. Corequisites: Registration in BIO 363 is required. Special Notes: This is a designated research course. Offered: Spring, even # years.
**BIO 363 • Developmental Biology Lab** 1 Credit.
Laboratory experience accompanying BIO 362. Includes surgical manipulation of living organisms to elucidate developmental principles. Corequisites: Registration in BIO 362 is required. Offered: Spring, even # years. Special Notes: This is a designated research course.

**BIO 366 • Structure and Development of Vertebrates** 3 Credits.
An integrated and systematic approach to descriptive embryology and comparative anatomy of vertebrate species. Prerequisites: BIO 218 (may be taken concurrently). Corequisites: Registration in BIO 369 is required. Offered: Fall, odd # years.

**BIO 367 • Animal Physiology Lab** 1 Credit.
Laboratory experience accompanying BIO 376. Corequisites: Registration in BIO 376 is required. Offered: Spring, even # years.

**BIO 377 • Animal Physiology Lab** 1 Credit.
Laboratory experience accompanying BIO 376. Corequisites: Registration in BIO 376 is required. Offered: Spring, even # years.

**BIO 378 • Environmental Plant Biology** 3 Credits.
Exploration of the significant roles plants play in the environment - driving and responding to carbon, water availability, nutrient levels and light. The influence of abiotic factors on photosynthetic pathways, productivity and the movement of matter and energy will reveal how plants respond to rapid environmental changes. Course includes experiences working with data and statistics. Prerequisites: BIO 218 (may be taken concurrently) or two of the following: BIO 122/122D, BIO 126/127, BIO 128/128D, ENS 104/104D; one semester of Chemistry. Corequisites: Registration in BIO 383 is required. Special Notes: This is a designated research course. Offered: Spring, odd # years.

**BIO 383 • Environmental Plant Biology Lab** 1 Credit.
Laboratory experience accompanying BIO 380. Includes some outdoor and off-campus investigations. Corequisites: Registration in BIO 380 is required. Offered: Spring, odd # years. Special Notes: This is a designated research course.

**BIO 384 • Immunology** 3 Credits.
Study of the molecular and cellular mechanisms that allow organisms to recognize, control, and eliminate “nonself” entities such as bacterial pathogens, foreign tissue grafts, and even transformed (cancerous) cells. Prerequisites: Two semesters of Chemistry and either BIO 218 (may be taken concurrently) or BIO 120/120D and BIO 122/122D. (One of the following: BIO 234/235, BIO 332/333, BIO 354/355 is strongly recommended). Corequisites: Registration in BIO 387 is required. Special Notes: This is a designated research course. Offered: Fall, odd # years.

**BIO 387 • Immunology Lab** 1 Credit.
Laboratory experience accompanying BIO 384. Corequisites: Registration in BIO 384 is required. Offered: Fall, odd # years. Special Notes: This is a designated research course.
BIO 388 • Biochemistry I 3 Credits.
Physical and chemical properties of living systems with an emphasis on macromolecular interaction, structure, and function. Structure, classification, purification, and function of nucleic acids, proteins, carbohydrates, and lipids, including membrane transport and enzymology.
Prerequisites: BIO 120/120D or BIO 124/124D; CHE 226/227 (BIO 128/128D recommended).
Corequisites: Registration in BIO 389 is required.
Special Notes: Not open to students who have taken CHE 304/305, Carries cross-credit in chemistry.
Offered: Fall.

BIO 389 • Biochemistry I Lab 1 Credit.
Laboratory experience accompanying BIO 388. Techniques include spectroscopy, chromatography, centrifugation, electrophoresis, and enzyme kinetics.
Corequisites: Registration in BIO 388 is required.
Offered: Fall.

BIO 396 • Molecular Biology 3 Credits.
Modern advanced molecular genetic research. Topics covered include regulation of gene expression during development, molecular biology of cancer, animal virology, eukaryotic gene organization, and methods in gene manipulation.
Prerequisites: BIO 332/333; one additional biology course; CHE 224/225; CHE 226/227. Corequisites: Registration in BIO 397 is required Special Notes: This is a designated research course. Offered: Spring.

BIO 397 • Molecular Biology Lab 1 Credit.
Laboratory experience accompanying BIO 396. Consists of research projects utilizing recombinant DNA/genetic engineering techniques.
Corequisites: Registration in BIO 396 is required. Offered: Spring. Special Notes: This is a designated research course.

BIO 399 • Introduction to Research 1 Credit.
An introduction to research methodology in the biological sciences, with experience in the use of biological literature and an examination of how to distinguish and evaluate different types of scientific writing and presentations. Experience in the development of a research proposal.
Prerequisites: BIO 218; major in biology or related field; Junior standing. Special Notes: Carries cross-credit in environmental studies. Offered: Fall, Spring.

BIO 400 • Ultrastructure 3 Credits.
Electron microscopy as a tool in the sciences with emphasis on its use in biological investigation. Students prepare a portfolio of micrographs on a variety of material. Demonstrations, discussions, seminars, field trips, and individual practice.
Prerequisites: BIO 124/124D; Junior or senior standing. Corequisites: Registration in BIO 401 is required. Offered: Occasionally.

BIO 401 • Ultrastructure Lab 1 Credit.
Laboratory experience accompanying BIO 400. Corequisites: Registration in BIO 400 is required. Offered: Occasionally.

BIO 409 • Advanced Human Gross Anatomy 4 Credits.
For the undergraduate pre-health professions student. A regional approach to the study of anatomy through the supervised and directed student dissection of human cadavers. Identification of detailed structures and understanding their significance to the body.
Prerequisites: BIO 214/215 or consent of instructor. Offered: Interim.

BIO 481 • Internship in Biology 1-4 Credits.
A learning/practicing experience in which the student applies biological understanding and skills in an off-campus professional setting. Corequisites: Major or minor in Biology; Junior or senior standing. Offered: Fall, Spring.

BIO 493 • Literature Review in Biology 1 Credit.
Thorough review of the primary and secondary literature pertaining to a particular question, problem, or phenomenon in the biological sciences. Culminates in written report that is presented orally in BIO 499.
Prerequisites: BIO 399; Senior standing; consent of instructor. Offered: Fall, Spring.

BIO 495 • Biology Seminar 1-2 Credits.
Readings and discussions of topics that relate biology to one's Christian faith.
Prerequisites: BIO 399; Senior standing. Offered: Fall.

BIO 496 • Biology Research 1 Credit.
Students collect original data through independent laboratory research or field research under the supervision of a faculty member.
Prerequisites: BIO 399; Completion or co-completion of a tagged research course; consent of instructor. Special Notes: May be repeated once for credit. Offered: Fall, Spring.
B.A. in Biokinetics-Exercise Science as a Dual Degree with M.S. in Athletic Training

**BIO 497 • Advanced Biology Research** 1 Credit. Working under the supervision of a faculty mentor, students analyze the results of their original research completed in BIO 496 and write up their findings in a formal scientific paper. Results will be presented in class and possibly outside venues. 
*Prerequisites: BIO 496; consent of instructor. Offered: Fall, Spring.*

**BIO 499 • Biology Symposium** 1 Credit. The presentation of scientific research and literature. Culminates in departmental symposium in which students present their original research or literature review.
*Prerequisites: BIO 493 or BIO 496. Special Notes: Carries cross-credit in environmental studies. Offered: Fall, Spring.*

**HAS 110 • Introduction to Healthcare** 3 Credits. An introduction to various health professions and the healthcare system in the United States. Emphasis on understanding the healthcare system, current issues in healthcare, and healthcare career paths. Development of healthcare literacy and navigating healthcare culture. Students examine education, training, and licensure and/or certification requirements for potential careers.
*Offered: Fall, Spring.*

**HAS 120 • First Aid** 1 Credit. Emphasizes the citizen responder as the first link in the emergency medical services system through the American Red Cross First Aid course. Includes CPR/AED for the Professional Rescuer.
*Offered: Fall, Spring.*

**HAS 130 • Personal and Community Health** 3 Credits. Focus on health promotion and the development of skills to make informed lifestyle decisions. Examination of current information on major health issues including exercise, nutrition, stress, tobacco/alcohol/drug use, mental health, sexual health, environmental health, and disease. Emphasis on the importance of becoming an advocate for personal, family, and community health.
*Offered: Fall, Spring.*

**HAS 170 • Applied Nutrition** 3 Credits. Effects of nutrition on health, human performance and reduction of chronic disease throughout the lifespan. Topics covered also include disordered eating, weight management, supplements, and societal and cultural issues related to nutrition.
*Offered: Fall, Interim, Spring.*

**HAS 200Q • Professional Activities: Individual/Dual 4 Credits.** Developmental progressions to improve personal skill through instruction, practice, and corrective feedback. Exposure to various teaching methods while participating in individual and dual sports that include badminton, golf, tumbling, tennis, and track and field. Students lacking competency in lifetime activities are encouraged or required (at discretion of the department) to take one or more separate Q courses to meet competency.
*Prerequisites: Sophomore class standing. Consent of instructor. Offered: Fall 2020.*

**HAS 201 • Foundations of Physical Education** 2 Credits. An examination of the historical, philosophical, sociological, and psychological foundations of physical education from its earliest beginnings through the 20th century. Development of a philosophical base for physical education and study of specific issues, trends, and professional opportunities related to physical education and sport.
*Offered: Fall 2019.*

**HAS 205QA • Self-expression through Dance** 2 Credits. Provides students with opportunities to experience a wide variety of rhythmic movement and dance to enhance creative expression, fitness development, and understanding of, and appreciation for, a variety of dance forms. Students think and move creatively and develop rhythmic skills through participation in aerobic dance, square dance, ethnic dance, and ballroom dance.
*Offered: Occasionally.*
HAS 210Q • Professional Activities: Team 3 Credits.
Development of usable progressions and methods for teaching the skills involved in team sports. Emphasis on personal skill practice, with attention to motivation, feedback, and other concepts of motor learning. Sports include flag football, soccer, volleyball, basketball, team handball, and softball. Students lacking in competency in lifetime activities are encouraged (at discretion of the department) to take one or more separate Q courses to meet competency. Prerequisites: Sophomore class standing, Consent of instructor. Offered: Spring 2019, 2020.

HAS 215Q • Professional Activities: Conditioning 2 Credits.
Developmental progressions to improve personal skill through instruction, practice, and corrective feedback. Exposure to various teaching methods while participating in swimming, weight training, and aerobic exercise. Students lacking competency in lifetime activities are encouraged or required (at discretion of the department) to take one or more separate Q courses to meet competency. Prerequisites: Sophomore class standing or consent of instructor. Offered: Fall 2019.

HAS 220A • Educational Rhythms 3 Credits.
Principles of teaching rhythmic movement, emphasizing aspects of creativity, square dance, social dance, rhythms with equipment, and ethnic dances from various countries. Includes practice and incorporation of skills into multiple teaching situations. Prerequisites: Sophomore class standing, Consent of instructor. Offered: Spring 2020.

HAS 247 • Motor Development and Learning 3 Credits.
The mechanisms of human motor learning and development with special emphasis on the physical and psychological principles involved in the acquisition and maintenance of motor skills. Prerequisites: BIO 214/BIO 215. Offered: Fall, Spring.

HAS 250M • Statistics and Research Methods in Applied Health Sciences 3 Credits.
Descriptive statistics. Discrete probability spaces, random variables, and distributions. Normal distribution, statistical inference, estimation, hypothesis testing, linear regression, correlation analysis, and analysis of variance. Applications to healthcare and Institutional Review Board (TRB) human-based research projects. Offered: Fall, Spring. Special Notes: Students may not receive credit for both HAS 250M and PSY 230M.

HAS 303KZ • Integrative Medicine in a Cross-Cultural Setting 3 Credits.
An introduction to the theories and practices of integrative medicine as a means to promote quality health and wellness. Students in this course are exposed to a variety of health models ranging from ancient Mayan practices to modern Western medical practices in order to develop a more holistic approach to health and well-being. Course is taught in Belize, Central America. Scientific theories include ethnobotany, psychoneuroimmunology, integrative nutrition, and biofeedback. Personal practices may include therapeutic touch, yoga, mindfulness, contemplative prayer, nature therapy, and healing effects of physical activity and movement. Prerequisites: Laboratory Science (D) course; Mathematics (M) course. Offered: Occasionally interim.

HAS 306 • Administration of Athletics and Physical Education 2 Credits.
Theories, procedures, and problems involved in the administration of athletic and physical education programs at the interscholastic level and in fitness organizations. Offered: Fall 2019.

HAS 314 • Foundations, Administration, and Evaluation of Health Education 3 Credits.
Introduces the health education and health promotion professions, including historical, philosophical, and theoretical foundations of health education. Explores theories of behavior change, the responsibilities of health educators, and investigates career opportunities. Examines the theoretical and practical basis for planning, implementing, administering, and evaluating health education programs. Prerequisites: HAS 130. Offered: Spring.
HAS 316 • Curriculum Development in Physical Education 3 Credits.
Curriculum theory, history, and philosophy. Procedures for translating theory into workable models for physical education, grades K–12, and non-school settings. Writing unit and lesson plans to reflect sequencing of content that differentiates across a range of students’ developmental levels. Prerequisites: Sophomore standing. Offered: Spring 2019, 2021.

HAS 318 • Epidemiology 2 Credits.
Study of distribution of health and disease in populations and its influential or determining factors. Examination of methodological and analytical techniques to summarize health-related indicators in populations. Focus on the tools and epidemiologic methods used to identify, prevent, and control disease and health-related conditions. Review of the epidemiology of many major diseases and health-related conditions. Prerequisites: HAS 130; BIO 104/104D or BIO 122/122D; BIO 238/239 or (BIO 214/215; BIO 216/217). Offered: Fall, even # years.

HAS 320 • Developmental and Adapted Physical Education 3 Credits.
Developmental, remedial, and corrective means to meet the needs of special students in grades K-12 and non-school settings. Emphasis on underlying principles of perceptual and motor development, and use of principles in programming for a variety of disabilities. Offered: Spring 2019, 2021.

HAS 321 • Developmental and Adapted Field Experience 1 Credit.
Application of ideas from HAS 320 in a 32-hour field experience with hours dispersed between school and community settings. Prerequisites: Sophomore standing. Corequisites: Should be taken concurrently with HAS 320, but may be taken in a different term if necessary. Special Notes: Times and locations are established by the HAS 320 instructor. Offered: Spring 2019, 2021.

HAS 322 • Methods and Materials for Adapted Physical Activity 2 Credits.
Resources and methodology for teaching a wide variety of activities to individuals with disabilities. Resources include understanding of DAPE literature, family systems, and community services as they relate to the transition process. Methodology includes planning lessons, incorporating assistive devices, and utilizing assessment tools. Prerequisites: EDU 250, HAS 320. Offered: Fall, odd # years.

HAS 323 • Developmental and Adapted Physical Education Practicum 2 Credits.
Practical experience working alongside licensed professionals in the field to deliver services to special education students in their least restrictive and/or integrated environments. Students gain experience planning, leading, and assessing activities relative to IEP goals, and reflecting on their effectiveness. Prerequisites: EDU 250, HAS 320. Offered: Fall.

HAS 325 • Prevention and Care of Athletic Injuries 3 Credits.
Techniques for prevention and care of athletic injuries. Practical experience in the athletic training room. Prerequisites: HAS 120; BIO 214/215 or BIO 238/239. Offered: Fall.

HAS 331 • Organization and Administration of Athletic Training 3 Credits.
Methods for planning, coordinating, and supervising all administrative components of an athletic training program pertaining to healthcare, financial management, training room management, personnel management, and public relations. Prerequisites: HAS 325. Offered: Fall.

HAS 332 • Advanced Athletic Training - Lower Extremity 3 Credits.
Advanced techniques for the evaluation and treatment of athletic injuries to the lower extremity. Prerequisites: HAS 325; BIO 214/215; BIO 216/217. Special Notes: This course is no longer offered at the undergraduate level. Offered: Fall.
HAS 333 • Advanced Athletic Training - Upper Extremity 3 Credits.
Advanced techniques for the evaluation and treatment of athletic injuries to the upper extremity.
Prerequisites: HAS 325; BIO 214/215; BIO 216/217.
Special Notes: This course is no longer offered at the undergraduate level. Offered: Spring.

HAS 335 • Clinical Experience in Athletic Training I 1 Credit.
Clinical experiences that provide opportunities to practice, refine, and master previously learned psychomotor and cognitive athletic training competencies.
Prerequisites: Admission to athletic training program; HAS 325. Offered: Fall.

HAS 336 • Clinical Experience in Athletic Training II 1 Credit.
Clinical experiences that provide opportunities to practice, refine, and master previously learned psychomotor and cognitive athletic training skills.
Prerequisites: HAS 335. Offered: Interim.

HAS 337 • Clinical Experience in Athletic Training III 1 Credit.
Clinical experiences that provide opportunities to practice, refine, and master previously learned psychomotor and cognitive athletic training competencies.
Prerequisites: HAS 336. Offered: Spring.

HAS 340 • School Health and Drug Issues 3 Credits.
Examines the roles of teachers and schools in responding to adolescent health problems, with particular attention to health promotion, prevention, and referral, and to the unique role of the school health educator in this process. Topics include alcohol/drug use and abuse, mental health issues, eating disorders, violence, child abuse and neglect, and injuries. Emphasis on the characteristics of effective coordinated school health programs, including the development of comprehensive prevention curriculum.

HAS 345 • Disease and Injury Control 2 Credits.
Analysis of chronic diseases, infectious diseases, and injuries from both personal and societal perspectives. Focuses on the prevention, identification, and control of diseases and injuries. Examines the relationship of health promotion and lifestyle to disease and injury.
Prerequisites: HAS 120; HAS 130. Offered: Fall, odd # years.

HAS 351 • Therapeutic Interventions I 3 Credits.
Various therapeutic modalities used in the treatment of sport-related injuries. Includes the use of thermal, electrical, light, and acoustical media as modalities for therapy. The physiological effects, clinical applications, and techniques for use are discussed for each modality. Includes practical experience.
Prerequisites: HAS 325, BIO 214/215. Special Notes: This course is no longer offered at the undergraduate level. Offered: Fall.

HAS 352 • Therapeutic Interventions II 3 Credits.
Design, implementation, and supervision of rehabilitation programs for sport-related injuries. Topics include reconditioning programs, manual therapy, and functional rehabilitation. Includes laboratory experience in the various techniques used in therapeutic exercise.
Prerequisites: HAS 325, HAS 375. Special Notes: This course is no longer offered at the undergraduate level. Offered: Spring.

HAS 360 • Advanced Emergency Care 3 Credits.
A comprehensive course for the healthcare practitioner who must initially evaluate and stabilize a physically active individual in a trauma situation. Teaches rapid assessment, resuscitation, packaging, and transportation of the ill or injured.
Prerequisites: HAS 325, HAS 120. Offered: Spring.

HAS 370 • Functional Human Nutrition 3 Credits.
Prepares students in functional nutrition, emphasizing human biochemistry and cellular energetics. Explores the relationship of nutrients to health pathologies, including metabolic syndrome, obesity, diabetes, cardiovascular disease and cancer. Practical experience with nutritional interventions for health optimization and disease management. Emphasis in biochemical individuality for positive, nutritional modulation in oxidative phosphorylation.
Prerequisites: BIO 122 (or equivalency) or CHE 113/113D; HAS 170. Offered: Fall, Spring.

HAS 375 • Biomechanics 3 Credits.
Prerequisites: BIO 214/215, BIO 238/239; Mathematics (M) course. Offered: Fall, Spring.
Special Notes: PHY 102/102D and HAS 247 are recommended prerequisites.
HAS 376 • Exercise Physiology and Assessment
3 Credits.
Basic principles of measurement and evaluation, particularly as they relate to physiological training and adaptation in the context of physical education instruction for normal and special populations.

HAS 379 • Integrative Human Physiology
3 Credits.
Examination of how normal human physiological function (homeostasis) is altered, and subsequently restored, in response to various forms of acute and chronic stress.
Prerequisites: BIO 214/215; BIO 216/217. Offered: Fall, Spring.

HAS 393 • Literature Review in Biokinetics
1 Credit.
Students develop and work on their research project and IRB. Students will use literature to formulate an independent project. Completion of IRB is expected. Seminar includes discussions of careers, graduate and medical school application and entrance examines.
Corequisites: Concurrent registration in HAS 399. Offered: Spring.

HAS 398 • Physiological Assessment Laboratory
1 Credit.
Laboratory experience accompanying HAS 399. Prerequisites: HAS 379, (may be taken concurrently). Corequisites: Concurrent registration in HAS 393 and HAS 399 is required. Offered: Spring.

HAS 399 • Physiological Assessment
3 Credits.
Applied techniques in the measurement of exercise bioenergetics, neuromuscular performance, cardiorespiratory fitness, and other health components. Particular emphasis is given to the knowledge necessary for exercise testing certifications and development of fitness testing skills.
Prerequisites: HAS 379 (may be taken concurrently). Corequisites: Concurrent registration in HAS 393 and HAS 398 is required. Offered: Spring.

HAS 436 • Clinical Experience in Athletic Training
IV 1 Credit.
Clinical experiences at an off-campus clinical affiliate site designed to provide athletic training students the opportunity to practice, refine, and master previously learned psychomotor and cognitive athletic training competencies.
Prerequisites: HAS 337; Senior standing. Offered: Fall, Interim, Spring.

HAS 439 • Clinical Experience in Athletic Training
V 3 Credits.
Acquire 320+ hours of athletic training experience working with a Bethel University athletic team for a complete season of competition, under the supervision of an athletic training program preceptor.
Prerequisites: HAS 337. Offered: Fall, Interim, Spring.

HAS 440 • Advanced Training for Human Performance
3 Credits.
Prepares students to systematically design training and conditioning programs to enhance the function and capacity of the musculoskeletal and cardiovascular systems. This course utilizes periodization and mathematical models with expected physiological and neuromuscular adaptations to maximize human performance in sport, pre-habilitation, public health and special populations.
Prerequisites: BIO 216/217; BIO 238/239 or permission of instructor. Offered: Fall.

HAS 445 • Advanced Laboratory Techniques in Biokinetics
3 Credits.
Collection, interpretation, and prescription of human subjects data will be conducted. Activities focus on how to work in a dynamic laboratory and refine and master previously learned assessment skills.
Prerequisites: HAS 399. Offered: Fall.

HAS 450 • Clinical Neuromuscular Interventions
3 Credits.
Clinical Neuromuscular Interventions focuses on learning to synthesize academic content from a variety of foundational classes in the department, the relational and hands-on skills of the assessment lab, and guidance from a practicing clinician to foster an in-depth exploration of a variety of topics. Explores a basic review of the anatomy and physiology of the nervous system and builds to investigate neurologic atypical and/or pathological conditions through a series of guided case studies. This course is a blend of independent and team learning, hands-on labs, and experiential observations. Each case study presented will assist in understanding both the clinical context of a condition and the general application of health, fitness, and wellness concepts after discharge from a medical setting.
Prerequisites: HAS 375; HAS 399. Offered: Fall, Spring.
HAS 478 • Senior Seminar in Athletic Training 3 Credits.
A capstone course in which students study and implement competencies in professional development and responsibility, as well as evidence-based medicine. Students complete and present an in-depth, evidence-based medicine research project. Aids student preparation for the Board of Certification Exam in Athletic Training. Prerequisites: Admission to the athletic training education program. Offered: Spring.

HAS 481 • Internship in Human Kinetics and Applied Health Science 1-3 Credits. 
A practical experience in an off-campus setting in applying academic knowledge and professional skills under the dual supervision of a faculty member and a practicing professional. Designed by student in consultation with a faculty member. Prerequisites: HAS 399, Consent of instructor. Special Notes: Application must be made at least one semester prior to the intended experience. Offered: Fall, Spring.

HAS 494 • Biokinetics Research 1 Credit. 
Students develop and work on their senior research project. Students will complete data collection. Students will continue the discussion on "life after Bethel." In addition, social networking and public speaking and presentations will be explored. Prerequisites: HAS 393. Offered: Fall.

HAS 495 • Biokinetics Symposium 1 Credit. 
Students prepare and deliver formal presentation and manuscripts of their research results. Weekly discussions are organized on current research topics. This course will continue the discussion of "life after Bethel." Prerequisites: HAS 494. Offered: Spring.