

# KINESIOLOGY

## Degree: B.S., Biology

Department of Biological Sciences (<https://cas.umw.edu/biology/>)

Biology encompasses the study of all living things and their interactions with the environment. The Department faculty is dedicated to providing students with a strong undergraduate education in the fundamental principles of biology, while offering opportunities and encouraging students to pursue specialized interests in the field of kinesiology.

The Kinesiology major is designed for students pursuing careers in Physical Therapy, Occupational Therapy, Sports Medicine, and Athletic Training, or graduate study in Exercise Sciences, Kinesiology, and Physiology. This major track provides students with the discipline-specific knowledge and skills to be successful candidates for careers and graduate study in a broad range of exercise/ rehabilitation/ sports and medical fields. Students who complete all requirements earn the degree of Bachelor of Science (B.S.) in Biology with a major in Kinesiology.

This core curriculum provides a thorough foundation of biology's fundamental principles, including organism function, cell biology, and the research process, as well as an understanding of the basis of movement and physical activity, through courses in physics, anatomy, and biomechanics, and exercise physiology. The curriculum is rounded out with relevant upper-level biology electives, and one course from a list of non-BIOL courses examining societal perspectives on health and sport.

To promote skills that students need to be effective health practitioners, athletic trainers, and researchers, this track also includes both a "Practical Kinesiology" requirement and a "Research Capstone" requirement. Majors can select one of three options to fulfill the Practical Kinesiology requirement: Introduction to Coaching (PHYD 230 Introduction to Coaching), or a 2-credit internship through Biological Sciences (BIOL 499 Internship) or Physical Education (PHYD 499K Kinesiology Internship). For the "Research Capstone," students may complete a Research-Intensive laboratory course that explores aspects of kinesiology, and present their findings at a University research symposium. Alternatively, majors may conduct independent research in kinesiology under the mentorship of a faculty. On many occasions this independent work results in presentations at state, regional, and national scientific meetings. Research students who meet minimum requirements (3.00 overall GPA and a 3.25 major GPA) may pursue Honors in Biology by writing and defending a thesis on their independent research. Financial support for student research is available.

All of the equipment and facilities in the department are available for undergraduate student use. Collections of microscope slides and anatomical specimens are available to enhance learning. Physiology labs include electrocardiograph and neurophysiology equipment, dynamometers, and respirometers. Additional advanced laboratory equipment includes spectrophotometers, thermal cyclers, fluorescent plate readers, ultracentrifuges, tissue culture facilities, and a wide variety of high-quality microscopes (light, fluorescent, scanning electron, and transmission electron) to allow students to engage in sophisticated research. Additionally, an extensive range of exercise and training equipment is available at the University fitness center and athletic training facility.

Students can also gain focused research experience via participation in the UMW Summer Science Institute. Additionally, biology faculty offer research opportunities through the university's undergraduate

research (URES 197 Undergraduate Research) program. Students may also take advantage of Biology service-learning opportunities (BIOL 000 Community Service Learning).

## Student Learning Outcomes

Students will demonstrate knowledge of Core Concepts for Biological Literacy. Students will demonstrate knowledge of:

1. Core Concept of the concepts and processes of evolution.
2. Core Concept of the nature of structure and function.
3. Core Concept of information flow, exchange, and storage.
4. Core Concept of the pathways and transformations of energy and matter.
5. Core Concept of the nature of biological entities as systems.

Students will demonstrate abilities of Core Competencies for the Practice of Biology. Students will be able to:

6. Core Competency for the practice of Biology of how to apply the processes of science.
7. Core Competency for the practice of Biology of how to use quantitative reasoning.
8. Core Competency of the practice of Biology of how to use modeling and simulation.

Students will demonstrate abilities of Core Competencies for Societal Issues in Biology. Students will be able to:

9. Core Competency for societal issues in Biology of the ability to tap into the interdisciplinary nature of science.
10. Core Competency for societal issues in Biology of the ability to communicate and collaborate with other disciplines.
11. Core Competency for societal issues in Biology of the ability to understand the relationship between science and society.

**Students must earn a C- or better in most BIOL required courses that serve as prerequisites for other BIOL courses. Students must also earn a C- or better in the core courses** (BIOL 260 (<https://catalog.umw.edu/search/?P=BIOL%20260>) Biostatistics and Research Design, BIOL 340 (<https://catalog.umw.edu/search/?P=BIOL%20340>) Cellular Biology, BIOL 384 Human Anatomy, BIOL 414 Exercise Physiology ), and BIOL 471 (<https://catalog.umw.edu/undergraduate/majors/biomedsciences/#requirementstext>) Biomechanics **to graduate with a major in Kinesiology. See also the Department of Chemistry's minimum grade requirements for** CHEM 111 (<https://catalog.umw.edu/search/?P=CHEM%20111>) General Chemistry I, CHEM 112 (<https://catalog.umw.edu/search/?P=CHEM%20112>) General Chemistry II.

## Major Requirements

| Code        | Title                             | Credits |
|-------------|-----------------------------------|---------|
| BIOL 126    | Phage Hunters II                  | 4       |
| or BIOL 132 | Organism Function and Diversity   |         |
| BIOL 260    | Biostatistics and Research Design | 4       |
| BIOL 340    | Cellular Biology                  | 4       |
| BIOL 414    | Exercise Physiology               | 3       |
| BIOL 471    | Topics in Biology (Biomechanics)  | 4       |
| BIOL 384    | Human Anatomy                     | 4       |
| PHYS 102    | General Physics w/Lab             | 4       |
| or PHYS 106 | University Physics w/Lab          |         |

|                                                                                                             |           |
|-------------------------------------------------------------------------------------------------------------|-----------|
| One of the following Societal Perspectives on Health Elective courses:                                      | 3         |
| PSYC 354 Sport Psychology                                                                                   |           |
| PSYC 339 Health Psychology                                                                                  |           |
| COMM 378 Health Communication                                                                               |           |
| SOCG 334 Medical Sociology                                                                                  |           |
| PHIL 226 Medical Ethics                                                                                     |           |
| Upper level Biology                                                                                         | 4         |
| BIOL 410 Neurobiology                                                                                       |           |
| BIOL 413 Human Physiology                                                                                   |           |
| BIOL 415 Nutrition and Metabolism                                                                           |           |
| BIOL 416 Vertebrate Endocrinology                                                                           |           |
| BIOL 451 Seminar <sup>1</sup>                                                                               |           |
| BIOL 471 Topics in Biology <sup>1</sup>                                                                     |           |
| Applied Electives                                                                                           | 2         |
| BIOL 499 Internship<br>or PHYD 499 Kinesiology Internship                                                   |           |
| PHYD 230 Introduction to Coaching                                                                           |           |
| One Research Intensive Course or Course Sequence                                                            | 4         |
| BIOL 472 Research-Intensive Topics in Biology <sup>1</sup>                                                  |           |
| BIOL 481 Research Design & Proposal Development in<br>& BIOL 491 Biology<br>and Special Problems in Biology |           |
| BIOL 419 Neuroethology                                                                                      |           |
| BIOL 472K Research in RNA Technology                                                                        |           |
| <b>Total Credits</b>                                                                                        | <b>40</b> |

<sup>1</sup> Approved sections only.

## General Education Requirements

The general education requirements for Bachelor of Arts/Bachelor of Science degrees (<https://catalog.umw.edu/undergraduate/general-education/requirements-bachelor-arts-bachelor-science-degrees/>) apply to all students who are seeking to earn an undergraduate B.A., B.S. or B.S.Ed. degree.

Students seeking a Bachelor of Liberal Studies degree have a separate set of BLS general education requirements (<https://catalog.umw.edu/undergraduate/general-education/requirements-bachelor-liberal-studies-degrees/>).

## Electives

Elective courses are those that are not needed to fulfill a general education requirement or major program requirement but are chosen by the student to complete the 120 credits required for graduation with a B.A./B.S./B.S.Ed. degree or the BLS degree. These courses may be taken graded or pass/fail (or S/U in the case of physical education and 100-level dance). No student in a regular B.A./B.S./B.S.Ed. program may count more than 60 credits in a single discipline toward the 120 credits required for graduation.

**Total Credits Required for the Degree:** 120 credits

## Plan of Study

*For a suggested plan of study for the Kinesiology major, please contact the Department of Biological Sciences directly.*

## Biological Sciences Faculty

Dianne M. Baker, Chair

### Professors

Dianne M. Baker  
Andrew S. Dolby  
Alan B. Griffith  
Lynn O. Lewis  
Deborah A. O'Dell

### Associate Professors

Swati Agrawal  
Theresa M. Grana  
Bradley A. Lamphere  
Ginny R. Morriss  
Abbie M. Tomba  
R. Parrish Waters  
April N. Wynn

### Assistant Professors

Lauren A. Cirino  
Laura M. Sipe

### Senior Lecturer

Michael C. Stebar