

# Human Biology

Interdisciplinary Major or Minor (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/planning/interdisciplinary-majors-minors>)  
(Bachelor of Science)

Human Biology focuses on the study of the biological, physiological, nutritional, developmental, and evolutionary aspects of humans. The major has an extensive range of offerings with core courses emphasizing human function, genetics, nutrition, and evolution.

Students who major in Human Biology gain extensive skills within the laboratory environment, including physiological, cellular, molecular, and statistical analyses. The laboratories house state-of-the-art instruments and equipment for students to gain valuable experience. Participation in faculty research projects or internships is strongly encouraged.

All Human Biology majors complete an area of emphasis within the program. There are five areas of emphasis within the major:

- The **health science emphasis** provides preparation for medical, dental or other health-related professional schools; for graduate programs in biological or biomedical sciences; or entry-level research positions with pharmaceutical or biotechnology companies.
- The **exercise science emphasis** provides background for careers in exercise physiology and fitness, sports medicine, biomechanics, physical therapy, or occupational therapy.
- The **cytotechnology emphasis** is offered in affiliation with professional programs of cytotechnology at UW-Madison and the Mayo Clinic. Cytotechnology is the microscopic study of cells primarily for detection of cancer. This emphasis leads to a degree in Human Biology with eligibility for professional certification.
- The **nutritional sciences/dietetics emphasis** provides a focus on the biological and physical principles of nutrition. This emphasis is accredited as a Didactic Program in Dietetics by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics. Employment opportunities include healthcare, nutrition education, governmental and community health agencies, fitness facilities, public policy, agribusiness, and the food service industry. Students who successfully complete this program may apply for entry into a Dietetic Internship program, which is required to become a registered dietitian. Registered dietitians provide food and nutritional services with a focus on health promotion and disease prevention.
- The **general emphasis** is appropriate for students seeking careers in industrial, managerial, or sales positions in biological or health-related industries.

The Human Biology major/minor may be combined with other majors/minors for students interested in areas such as scientific journalism, scientific illustration, biological photography, genetic counseling, bioinformatics, public health administration, pharmaceutical sales, or other health-related professions.

Students may study abroad or at other campuses in the United States through UW-Green Bay's participation in international exchange programs and National Student Exchange. Travel courses are another option. For more information, contact the Office of International Education at (920) 465-2190 or see <http://www.uwgb.edu/international/>.

## Areas of Emphasis

Students must complete requirements in one of the following areas of emphasis:

- General Human Biology (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/major/general-emphasis>)
- Health Science (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/major/healthscience-emphasis>)
- Exercise Science (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/major/exercisescience-emphasis>)
- Cytotechnology (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/major/cytotechnology-emphasis>)
- Nutritional Sciences/Dietetics (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/major/nutritional-emphasis>)

Students must receive an average minimum GPA of 2.5 in the following foundation courses, with a minimum grade of C in each course, before declaring a Human Biology major.

BIOLOGY 201 & BIOLOGY 202	Principles of Biology: Cellular and Molecular Processes and Principles of Biology Lab: Cellular and Molecular Processes
HUM BIOL 204	Anatomy and Physiology
CHEM 211	Principles of Chemistry I
CHEM 212	Principles of Chemistry II

## Areas of Emphasis

Students must complete requirements in one of the following areas of emphasis:

- Applied Human Biology Emphasis (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/minor/applied-emphasis>)
- General Human Biology Emphasis (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/minor/general-emphasis>)

Students must receive an average minimum GPA of 2.5 in the following foundation courses, with a minimum grade of C in each course, before declaring a Human Biology minor.

BIOLOGY 201 & BIOLOGY 202	Principles of Biology: Cellular and Molecular Processes and Principles of Biology Lab: Cellular and Molecular Processes
HUM BIOL 204	Anatomy and Physiology
CHEM 211	Principles of Chemistry I
CHEM 212	Principles of Chemistry II

The following are curriculum guides for the four-year Human Biology degree program and is subject to change without notice. Students should consult a Human Biology program advisor to ensure that they have the most accurate and up-to-date information available about a particular four-year degree option.

- Human Biology Major with Exercise Science Emphasis Curriculum Guide (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/cg/exercise>)
- Human Biology Major with Cytotechnology Emphasis Curriculum Guide (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/cg/cytotechnology>)
- Human Biology Major with Human Biology General Emphasis Curriculum Guide (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/cg/general>)
- Human Biology Major with Health Science Emphasis Curriculum Guide (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/cg/health-science>)
- Human Biology Major with Nutritional Sciences / Dietetics Emphasis Curriculum Guide (<http://catalog.uwgb.edu/archive/2016-2017/undergraduate/programs/human-biology/cg/dietetics>)

**Michael Hencheck**; Associate Professor; Ph.D., Ohio State

**James C Marker**; Associate Professor; Ph.D., Brigham Young, chair\*

**Daniel J Meinhardt**; Associate Professor; Ph.D., Kansas\*

**Brian J Merkel**; Associate Professor; Ph.D., Virginia Commonwealth

**Amanda J Nelson**; Associate Professor; PH.D., Illinois at Urbana-Champaign

**Debra A Pearson**; Associate Professor; PH.D., UC-Davis

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**Donna Ritch**; Associate Professor; Ph.D., Pennsylvania State

**Le Zhu**; Associate Professor; Ph.D., Cornell

**Georgette Heyrman**; Assistant Professor; Ph.D.

**Paul R Mueller**; Assistant Professor; Ph.D., California Institute of Technology

**Laura M Rowell**; Lecturer

**Sara A Schmitz**; Lecturer; M.S., Alabama

**Donald F Drewiske**; Assoc Lecturer

**Andrea M Gruen**; Assoc Lecturer

**Kate N Jochimsen**; Assoc Lecturer

**Brandon J Schlotthauer**; Assoc Lecturer

**Bruce D Vandenplas**; Assoc Lecturer

**Sanath R Wijerathna**; Assoc Lecturer

## Courses

### **HUM BIOL 101. Introduction to Becoming a Scientist. 1 Credit.**

Learn about the challenges and rewards of a science major. Acquire essential professional skills using electronic databases and spread sheets that are needed by science majors. Learn about current science and the culture of scientists.

P: Fr or So status only.

Fall and Spring.

### **HUM BIOL 102. Introduction to Human Biology. 3 Credits.**

Basic concepts, principles, and processes in human biology; the origin of life, evolution, cells, biochemical processes, physiological systems, genetics and metabolism.

Fall and Spring.

### **HUM BIOL 116. First Aid and Emergency Care Procedures. 3 Credits.**

Student will learn all aspects of first aid training such as victim assessment and treating all types of illnesses and injuries; all skills for Professional Rescuer CPR; dealing with infectious diseases and their transmission.

Fall and Spring.

### **HUM BIOL 145. GPS Program Fall Workshop. 1 Credit.**

The GPS Fall Workshop is available only to first year students participating in the GPS Program. The goal of this course is to help you become a true stakeholder in your college education. Toward this end, in this class you will engage in activities to maximize your college success, work to identify your goals and passions, start building skills critical to personal and career success, and learn about and actively explore the many opportunities available to you at UWGB.

Fall Only.

### **HUM BIOL 146. GPS Program Spring Seminar. 1 Credit.**

This course will serve as a capstone to the Phoenix GPS program first year experience, and will challenge students to apply the knowledge and skills they've gained thus far in GPS to address a real-world problem. Students will develop and implement a service learning project with their class over the course of the semester, and will continue the work to build knowledge and skills critical to personal and career success.

Spring.

### **HUM BIOL 198. First Year Seminar. 3 Credits.**

topics vary

Reserved for New Incoming Freshman.

### **HUM BIOL 202. Ethnic Minorities in Science. 3 Credits.**

The history and culture of science in the US will be examined, in order to understand what has led to the current under-representation of ethnic minorities in science. The often overlooked contributions of scientists who are members of ethnic minorities will be recognized.

Spring.

### **HUM BIOL 204. Anatomy and Physiology. 5 Credits.**

This lecture and laboratory course examines the fundamental structure and function of tissues, organs, and systems of the human body.

P: Biology 201/202 with at least a C grade; AND Env Sci 207 or conc enr or Hum Biol 207 or conc enr.

Fall and Spring.

### **HUM BIOL 205. Biotechnology and Human Values. 3 Credits.**

Examination of technological developments in biology and medicine, including genetic, behavioral, and organism modification and the moral and ethical concerns raised by such technologies.

P: Hum Biol 102 or Biology 201/202.

Fall and Spring.

### **HUM BIOL 206. Fertility, Reproduction, and Family Planning. 3 Credits.**

Factors that influence reproduction and fertility, i.e., physiological, psychological, social, cultural, and ethical; the methods available for limiting or increasing reproduction; the nature of family planning programs.

P: Hum Biol 102 or Biology 201/202.

Fall and Spring.

### **HUM BIOL 207. Laboratory Safety. 1 Credit.**

This course examines safety within the science laboratory with emphasis on practical application. Topics include current safety regulations, identification of hazards, chemical labeling and storage, waste management, personal protective equipment, ventilation, spill response, and biosafety.

P: Biology 201 or 203 or Chem 108, 211 or 212 or Hum Biol 204 or conc enr.

Fall and Spring.

### **HUM BIOL 208. Scientific Conditioning of the Athlete. 2 Credits.**

Interrelationships between growth and development and athletic participation by pre-adolescents, principles of physiology of exercise, and general and specific techniques of physical and psychological conditioning are studied.

P: Hum Biol 102 with a grade of C or better OR Biology 201/202 with a grade of C or better.

Fall and Spring.

**HUM BIOL 210. Prevention and Treatment of Athletic Injuries. 3 Credits.**

Prevention, physical conditioning, strapping, properly fitted and designed equipment, condition of the competition site, conduct of practices, and respect of existing injuries; estimation the nature an extent of the injury, feasibility of moving the victim, immediate care at the scene, modes of required transport, sideline care, training room modalities, referral for definite diagnosis, and treatment of simple follow-up rehabilitation.

P: Hum Biol 102 with a grade of C or better OR Biology 201/202 with a grade of C or better.

Fall and Spring.

**HUM BIOL 217. Human Disease and Society. 3 Credits.**

Impact of diseases in humans. Emphasizes the major diseases, their causes, individual effects, historical significance, and methods of control.

Fall and Spring.

**HUM BIOL 299. Travel Course. 1-4 Credits.**

Travel courses are conducted to various parts of the world and are led by one or more faculty members. May be repeated to different locations.

P: cons of instr & prior trip arr & financial deposit.

**HUM BIOL 310. Human Genetics. 3 Credits.**

The molecular basis of heredity, genetic diseases, and genetic technologies including cloning, genetic testing, and gene therapy will be evaluated.

P: Biology 201/202 with at least a C grade ; Chem 108 or 212 with at least a C grade.

Fall and Spring.

**HUM BIOL 324. The Biology of Women. 3 Credits.**

This course will examine the physiology of the adult female body and will address health issues that are unique to or different in women. Emphasis will be placed on the effects of female sex hormones on multiple processes (reproductive, nervous, endocrine, and cardiovascular) in the body.

P: Hum Biol 102 with at least a C grade or Biology 201/202 with at least a C grade.

Spring.

**HUM BIOL 331. Science and Religion: Spirit of Inquiry. 3 Credits.**

This course examines the differing world views of science and religion; origins of science in the Judeo-Christian West; sources of conflicts; domains of validity; and of limitations of science and religion. This course may not be used as upper-level elective credits for a Human Biology major or minor.

P: Hum Biol 102 with at least a C grade or Biology 201/202 with at least a C grade; and sophomore status

Spring.

**HUM BIOL 333. Principles of Sports Physiology. 3 Credits.**

This course emphasizes the applied aspects of (exercise) physiology. Major topics include energy systems used during exercise, physiological dimensions of athletic performance/fatigue, principles of training, gender and exercise, ergogenic aids, and exercise in various environmental conditions.

P: Hum Biol 204 with at least a C grade; OR Biology 201/202 with at least a C grade; OR Biology 203/204 with at least a C grade

Spring.

**HUM BIOL 341. Human Anatomy Laboratory. 1 Credit.**

This course involves learning human anatomy and human anatomy dissection techniques using cadavers through the process of dissecting and analyzing human cadaver specimens. Students will learn detailed human anatomy for a specific area of interest by dissecting and identifying anatomical components of that area. In addition, students will learn major significant human anatomy for the entire human body to include muscles, nerves, blood vessels, glands, GI tract and reproductive systems.

P: Hum Bio 204 AND approval by instructor REC: Hum Bio 351, Bio 340

Fall Only.

**HUM BIOL 351. Kinesiology. 4 Credits.**

This course provides an in depth study of the human musculoskeletal system as it pertains to movement of the body and/or its parts. There are three major components to this course - anatomy (detailed musculoskeletal anatomy), functional anatomy (understanding bodily movement in light of anatomical structure), and biomechanics (mathematical quantification of bodily movement, forces, etc.)

P: Declared major or minor in Human Biology AND Env Sci 207 or conc enr or Hum Biol 207 or conc enr.

Fall and Spring.

**HUM BIOL 360. Exercise Physiology. 3 Credits.**

In this course, students learn the ventilatory, cardiovascular, muscular, hormonal, and metabolic response to (acute) exercise and exercise training.

P: Declared major or minor in Human Biology AND Math 260 AND Hum Biol 204, and concurrent enrollment in Hum Biol 361.

Fall and Spring.

**HUM BIOL 361. Human Physiology Lab - Exercise and Metabolism. 1 Credit.**

The laboratory involves measurement, analysis, and interpretation of a variety of physiological parameters that are associated with physical exercise. Students will do experiments designed to assess exercise related changes in heart rate, blood pressure, ventilation, and oxygen consumption.

Additionally, students will do assessments on EKG, pulmonary function, body composition and maximal exercise capacity.

P: concurrent enrollment in Hum Biol 360.

Fall Only.

**HUM BIOL 401. Art and Science. 1 Credit.**

Examination of art and science as ways of knowing, including discussion of various points of view regarding the differences and similarities between the two.

P: Hum Biol 102 or Biology 201/202 or Biology 203/204  
Spring.

**HUM BIOL 402. Human Physiology. 3 Credits.**

This course examines the physiologic functions of the major human organ systems. Topics include cell physiology; muscle, nervous, respiratory, circulatory, excretory, digestive, immune, and reproductive system functions; hormonal regulation pathways; and the role of physiology in diseases and medicine.

P: Hum Biol 204 with at least a C grade; OR Biology 201/202 with at least a C grade and Biology 203/204 with at least a C grade; OR transfer cse Biology 002; AND Chem 108 with at least a C grade or 212 with at least a C grade.  
Fall and Spring.

**HUM BIOL 403. Human Physiology Laboratory. 1 Credit.**

This course examines fundamental physiologic principles in a laboratory setting. Topics will include histology; muscle and nerve functions; respiratory and cardiac functions; and urinary system function. Students will gain experience in the process of designing, evaluating and presenting experimental results and develop skills in the reading of scientific literature.

P: Declared major or minor in Hum Biology; AND Hum Biol 402 with at least a C grade or conc enr or Biology 346 with at least a C grade or conc enr; AND Math 260; AND Env Sci 207 or conc enr or Hum Biol 207 or conc enr.  
Spring.

**HUM BIOL 405. Biotechnology and Ethics. 3 Credits.**

Examination of the science and ethics of biotechnology including genomics, eugenics, recombinant DNA technology, reproductive technology, stem cells, drugs, modified organisms, and treatment of diseases.

P: none; REC: Hum Biol 102 or Biology 201/202.  
Fall and Spring.

**HUM BIOL 413. Neurobiology. 3 Credits.**

This course will cover the physiological and molecular mechanisms of nervous system function. Topics include neuroanatomy; development and differentiation of neuronal cells; chemical and electrical functions; synaptic pharmacology; sensory receptors; learning and memory; and various disease states and medical treatments.

P: Biology 303 with at least a C grade; and Hum Biol 402 with at least a C grade or Biology 346 with at least a C grade.  
Fall Only.

**HUM BIOL 422. Immunology. 3 Credits.**

This course examines the mechanisms of vertebrate, particularly human defense against microbial invasion and cancer.

P: Biology 302 with at least a C grade or 307 with at least a C grade; Chem 212 with at least a C grade; and Math 260 with at least a C grade  
Spring Odd.

**HUM BIOL 423. Immunology Lab. 1 Credit.**

This laboratory course examines the mechanisms of innate and acquired immunity.

P: Hum Biol 422 or conc enr AND Env Sci 207 or conc enr of Hum Biol 207 or conc enr.  
Spring Odd.

**HUM BIOL 426. Cancer Biology. 3 Credits.**

This course examines the genetic changes and molecular events that lead to abnormal cell growth and cancer. Topics covered include oncogenes, tumor suppressor genes, angiogenesis, invasion and metastasis, cancer stem cells, therapeutic approaches for cancer treatment, and cancer prevention.

P: Biology 307 or Hum Biol 310 or Biology 410 with at least a C grade  
Spring Even.

**HUM BIOL 427. Cancer Biology Laboratory. 1 Credit.**

In this inquiry-based laboratory course, students will use molecular and cellular techniques to conduct research projects that examine the hallmark characteristics of cancer cells.

P: Hum Biol 426 or concurrent enrollment  
Spring Even.

**HUM BIOL 444. Endocrinology. 3 Credits.**

This course examines the major endocrine organs of the body and the processes that are controlled / integrated by hormones. Clinical examples of endocrine disease (e.g. diabetes, Graves disease) will be considered from the viewpoint of the insight they give to the understanding of endocrine physiology.

P: Hum Biol 402 with a C grade or better.  
Spring.

**HUM BIOL 478. Honors in the Major. 3 Credits.**

Honors in the Major is designed to recognize student excellence within interdisciplinary and disciplinary academic programs.

P: min 3.50 all cses req for major and min gpa 3.75 all UL cses req for major.

Fall and Spring.

**HUM BIOL 495. Research in Human Biology. 1-5 Credits.**

Work closely with a faculty member to plan, perform, evaluate, and report on laboratory research in human biology or a related field.

P: Hum Biol 207 or Env Sci 207 and approval by faculty mentor.

Fall and Spring.

**HUM BIOL 497. Internship. 1-16 Credits.**

Supervised practical experience in an organization or activity appropriate to a student's career and educational interests. Internships are supervised by faculty members and require periodic student/faculty meetings.

P: jr st.

Fall and Spring.

**HUM BIOL 498. Independent Study. 1-4 Credits.**

Independent study is offered on an individual basis at the student's request and consists of a program of learning activities planned in consultation with a faculty member. A student wishing to study or conduct research in an area not represented in available scheduled courses should develop a preliminary proposal and seek the sponsorship of a faculty member. The student's advisor can direct him or her to instructors with appropriate interests. A written report or equivalent is required for evaluation, and a short title describing the program must be sent early in the semester to the registrar for entry on the student's transcript.

P: fr or so st with cum gpa  $\geq$  2.50; or jr or sr st with cum gpa  $\geq$  2.00.

Fall and Spring.

**HUM BIOL 499. Travel Course. 1-6 Credits.**

Travel courses are conducted to various parts of the world and are led by one or more faculty members. May be repeated to different locations.

P: cons of instr & prior trip arr & financial deposit.