Faculty

Mark Bolyard (2006). Professor of Biology and Department Chair. B.A., Hanover College; Ph.D., University of North Carolina.

Jennifer Gruenke (2009). Professor of Biology and Director of the Center for Scientific Studies. B.S., Bryan College; Ph.D., University of Virginia.

James A. Huggins (1987). University Professor of Biology. B.S.A. and M.S., Arkansas State University; Ph.D., University of Memphis; Additional study, University of Tennessee at Memphis, Mid-America Baptist Theological Seminary, and University of Memphis.

James Kerfoot, Jr. (2009). Assistant Professor of Biology. B.S. and M.S., Southern Illinois University Edwardsville; Ph.D., Florida Institute of Technology.

James Marcus Lockett (2004). Associate Professor of Biology. B.S. and M.S., Murray State University; Ph.D., University of Tennessee.

Andy Madison (2002). Associate Professor of Biology. B.S., University of Tennessee; M.S., University of Kentucky; Ph.D., Kansas State University.

James Mahan (2010). Associate Professor of Biology. B.A., Vanderbilt University; M.S. and Ph.D., University of Memphis.

Tamara Popplewell (2008). Assistant Professor of Biology. B.S. and M.A.Ed., Union University; additional study, Mississippi State University.

Michael Schiebout (2013rsity

I. Major in Biology—42-48 hours
   A. General Biology Concentration/Independent Research Option—42-44 hours
      1. BIO 112, 302, 425, 426, 437, and 498—8 hours
      2. BIO 211, 213, 214, 215, and 315—20 hours
      3. Four 300-level BIO courses—14 hours minimum
   B. General Biology Concentration/Collaborative Research Option—45-47 hours
      1. BIO 112, 302, 415, and 498—7 hours
      2. BIO 211, 213, 214, 215, 304 and 315—24 hours
      3. Four 300-level BIO courses—14 hours minimum
   C. Zoology Concentration/Independent Research Option—43-44 hours
      1. BIO 112, 302, 425, 426, 437, and 498—8 hours
      2. BIO 213, 214; 200 or 211—12 hours
      3. BIO 316, five -300 level BIO excluding 307, 309, 322 and 337—23 hours minimum
   D. Zoology Concentration/Collaborative Research Option —47-48 hours
      1. BIO 112, 302, 415, and 498—7 hours
      2. BIO 213, 214; 200 or 211; 304—16 hours
      3. BIO 316, five 300-level BIO excluding 307,309, 322 and 337—23 hours minimum

II. Major in Cell and Molecular Biology—72–76 hours
   A. Independent Research Option—72–73 hours
      1. BIO 112, 211; 214 or 215—12 hours
      2. BIO 302, 315, 323, 325, 397, 498—16 hours
      3. Three of BIO 307, 309, 310, 316, 317, 320, 321, or 324—12 hours
      4. One 300-level BIO Elective—3 or 4 hours
      5. CHE 111, 112, 314, 315, 324, 326, 319, 329—26 hours
      6. BIO 425, 426 and 437—3 hours
      7. No minor is required
   B. Collaborative Research Option—75–76 hours
      1. BIO 112, 211; 214 or 215—12 hours
      2. BIO 302, 315, 323, 325, 397, 498—16 hours
      3. Three of BIO 307, 309, 310, 316, 317, 320, 321, or 324—12 hours
      4. One 300-level BIO Elective—3 or 4 hours
      5. CHE 111, 112, 314, 315, 324, 326, 319, 329—26 hours
      6. BIO 304 and 415—6 hours
      7. No minor is required

chosen course that outlines the additional course requirements

2. Attend at least four colloquia during each year (8 total) and, within one week of attendance, submit a reflection paper on each colloquium to his or her thesis adviser. At least one of the four colloquia attended each year must be sponsored by the Biology Department.
3. Design and complete an honors project/thesis that will lead to either an off-campus presentation or to a paper suitable for submission to an appropriate professional journal. This project meets the research requirement all Biology majors must complete prior to graduation.

Assessment of Majors

Biology majors are required to take two terminal courses as a requirement for graduation: BIO 415, Collaborative Research Experience or BIO 437 Research Experience; and BIO 498, Seminar. The Department may administer the Major Field Examination to senior biology majors in BIO 415 and 437.

Student Organizations

Biologists In Observation of the Master's Earth, BIOME, serves students interested in exploring the world of biology beyond the classroom. BIOME is designed primarily for biology majors and minors but is open to anyone with an interest in biology.

Union's Biology department has formed a local chapter of Tri-Beta, which is a society for students, particularly undergraduates, dedicated to improving the understanding and appreciation of biological study and extending boundaries of human knowledge through scientific research (. - . .).

Student Awards

The Biology Research Award is given by the faculty of the Department of Biology to the student in BIO 437 who presents the best research paper of the year, based on an original piece of work.

Whiteaker Freshman Biology Award. The Department selects a freshman major or minor based on outstanding scholastic achievement, financial need, Christian service, and school spirit.

Course Offerings in Biology (BIO)

( ) Hours Credit; F–Fall, W–Winter; S–Spring; Su–Summer

100. Survey of Biological Concepts (4) F, W, S
A course for non-science majors focused on the basic ideas to enable students to appreciate the living world and their relationship to it. Topics : the cell, genetic basis of life, biodiversity, survey of the 5 kingdoms of life, ecology, and the environment. Three hours lecture and 2 hours laboratory/week. No credit toward BIO major/minor.

110. Global Biology (4) S
A course for non-science majors focused on global issues in biology, including global diversity, global health; agriculture and biotechnology; and the interactions between humans and nature. Three hours lecture and 2 hours laboratory/week. No credit toward BIO major/minor.

112. Principles of Biology (4) F, S
A study of the basic characteristics of organisms, dealing with structure, function, reproduction, and ecology. Three hours lecture and 3 hours laboratory/week.

200. Wildlife Biology (4) S
Prerequisite: BIO 100 or 112.
Biological concepts involved in fisheries and wildlife biology, their application in practice, and exploration of contemporary issues facing the organisms, habitats, and human consumers. Three hours lecture and 3 hours laboratory/week.

201. Survey of Microbiology (4) F, S
Pre- or Corequisites: BIO 221 and BIO 222.
Emphasis on observation, growth, identification and control
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221. Human Anatomy and Physiology (4) F, Su
The first semester of a 2-semester course for nursing, physical education, and allied health students. Body systems studied include the integumentary, cardiovascular, lymphatic, skeletal, and muscular. Three hours lecture and 2 hours laboratory/week. No credit toward BIO major/minor.

222. Human Anatomy and Physiology (4) S, Su
A continuation of BIO 221. Systems studied include: urinary, nervous, endocrine, digestive, and respiratory. Three hours lecture and 2 hours laboratory/week. No credit toward a BIO major/minor.

300. Pathophysiology (3) F, W, S
Prerequisite: BIO 221 and 222.
Study of various states of altered health. Topics: stress, shock, altered acid-base balance, altered fluid and electrolyte balance, neoplasia, hypertension, immunodeficiency, genetic disorders, altered cardiac rhythms, renal failure and uremia. No credit toward a BIO major/minor.

302. Seminar Attendance (0) F, S
Prerequisites: 12 BIO hours, graded on a Pass/Fail basis. Students are required to attend all seminar presentations made by students enrolled in BIO 498 during the semester. Must be taken before enrolling in BIO 498.

303. Natural Resources Policy (3) F—Odd Years
Prerequisites: BIO 112, 200, and 4 hours applicable to the BIO major.
Examines current laws and policies governing public and private lands and the conservation of wildlife in the United States.

304. Experimental Design and Biostatistics (4) F
Prerequisites: 12 BIO hours; MAT 111 or higher (MAT 114 or 208 recommended)
Introduces students to the basic concepts and techniques underlying statistical analysis of data in a biological context. Students will be given the opportunity to identify a variety of biological problems, develop specific questions, design and conduct experiments to address these questions, formulate and test hypotheses, choose and run the appropriate statistical test, and interpret the outcomes of such test. Three hours lecture and 3 hours laboratory/week.

305. Conservation Techniques (3) S—Even Years
Prerequisites: BIO 112, 200, and 4 hours applicable to the BIO major.
A field intensive introduction to techniques for determining the age of many species, trapping for population assessments, terrestrial and aquatic sampling methods, methods for assessing population health through necropsies, and habitat management techniques. One hour lecture and 6 hours laboratory/week.

307. Advanced Human Anatomy and Physiology I (4) F
Prerequisite: BIO 112, 214 and 4 hours applicable to the BIO major.
The 1st of a 2-semester sequence designed primarily for science majors seeking to establish a knowledge base of human anatomy and physiology. Body systems studied include the integumentary, skeletal, muscular, and nervous systems. Three hours lecture and 3 hours laboratory/week.

309. Advanced Human Anatomy and Physiology II (4) S
Prerequisite: BIO 307.
A continuation of BIO 307 studying body systems: endocrine, cardiovascular, respiratory, urinary, digestive, and lymphatic. Three hours lecture and 3 hours laboratory/week.

310. Histology (4) W–Odd Years
Prerequisite: BIO 112 and 8 hours applicable to the BIO Major.
The branch of anatomy that deals with structure, composition, design and function of body tissues as it relates to the principles of physiology, biochemistry, molecular biology and medicine. Three hours lecture and 3 hours laboratory/week.

312. Comparative Vertebrate Anatomy (4) W–Odd Years
Prerequisite: BIO 112, 214, and 4 hours applicable to the BIO major.
Study of the similarities of anatomy and early development of vertebrates, complemented by dissection of representative adults. Three hours lecture and 3 hours laboratory/week.

315. Genetics (4) S
Prerequisites: BIO 112, BIO 211, and 4 hours applicable to the BIO major.
A study of the principles of heredity including both

320. Immunology (4) F
Prerequisite: BIO 211, CHE 314, and 8 additional BIO hours.
Structure and function of the immune system and some diseases related to the immune system. Laboratory will focus on a group research project. Three hours lecture and 3 hours laboratory/week.

321. Ecotoxicology (4) W—Even Years
Prerequisites: BIO 112, 8 hours applicable to the BIO major and CHE 111-2.
A comprehensive overview of the ecological consequences of

359. Dendrology (4) F-Even Years
Pre-requisites: BIO 112, 215, and 4 additional hours applicable to the BIO major.
This course will focus on the identification and management of trees, focusing on forest ecology and silvicultural practices. The laboratory will include field trips that will focus on tree identification. Three hours lecture and three hours laboratory/week.

360. Plant-Insect Interactions (4) F-Odd Years
Pre-requisites: BIO 112, 213, and 215
This course is designed to introduce the student to insects and their relationships with plants. Lecture will cover insect ecology, taxonomy, and biology, as well as plant strategies to overcome insect damage and mutualism between plants and insects. The laboratory and field