DEPARTMENT OF BIOLOGY

COLLEGE OF ARTS AND SCIENCES

Faculty

Mark Bolyard (2006). University Professor of Biology and Department Chair. B.A., Hanover College; Ph.D., University of North Carolina; Additional study, Michigan State University; Penn State College of Medicine.

Jeremy Blaschke (2015). Assistant Professor of Biology. B.S., Bryan College; M.S. and Ph.D., University of Tennessee, Knoxville.

Euna (Esther) Choi (2016). Assistant Professor of Biology. B.S. and M.S., Hallym University (Chuncheon, South Korea); Ph.D., University of Illinois; Additional Study, University of Nebraska

Micah Fern (2018). Assistant Professor of Biology. B.S., Union University; M.S. and Ph.D., Auburn University.

Hannah Henson (2016). Assistant Professor of Biology. B.S., Union University; Ph.D., University of Tennessee; Additional Study, University of Kentucky.

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, Memphis, Mid-America Baptist Theological Seminary, and University of Memphis.

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

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University.

Michael Schiebout (2012). Associate Professor of Biology. B.A., Dordt College; M.S. and Ph.D., University of Northern Colorado.

William Thierfelder (2014). Associate Professor of Biology and Director of the Hammons Center for Scientific Studies. Sc.B, Brown University; Ph.D., University of Pennsylvania; Additional study, St. Jude Children's Research Hospital.

Faith A. Zamamiri-Davis (2011). Associate Professor of Biology. B.S., Westmont College; Ph.D., Pennsylvania State University; Additional study, St. Jude Children's Research Hospital.

Instructional Staff

Juliana Cobb (2017). Laboratory Specialist. B.S., Union University; M.S., East Carolina University.

Lisa Conway (2012). Laboratory Specialist. B.S. and D.V.M., Texas A&M University.

Heather Hetrick (2019). Laboratory Specialist. B.S. and M.U.Ed., Union University

Cathy Huggins

Conservation Biology Majors may meet the requirements to become a Certified Wildlife Biologist by taking twelve hours of communication. The General Core requirement for COM 112 and electives of COM 121 and COM 235 may be used to fulfill 9 hours of this requirement. The remaining hours may be selected in consultation with your assigned faculty advisor.

I. Major in General Biology–42 hours
   1. BIO 112, 210, 211, 215, 315, 318–24 hours
   2. Four 300-level BIO courses–14 hours minimum
   3. BIO 425, 426, 437, 498–4 hours

   (Majors are required to take CHE 111 from Group A list of laboratory science options in the general core.)

II. Major in Zoology–43–44 hours
   1. BIO 112, 200, 210, 211, 301, 312, 316, 336–32 hours
   2. Select one from: BIO 304, 310, 315, 317, 323, 325–4 hours
   3. Select one from: BIO 318, 321, 324, 356, 357, 360–3 or 4 hours
   4. BIO 425, 426, 437, 498–4 hours

   (Majors are required to take CHE 111 from Group A list of laboratory science options in the general core.)

III. Major in Cell and Molecular Biology–72–73 hours
   1. BIO 112, 211; 210 or 215–12 hours
   2. BIO 315, 323, 325, 397–15 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, 437, 498–4 hours
   7. No minor is required

IV. Major in Conservation Biology–66–68 hours
   A. Prerequisites or Corequisites: CHE 111; 2 MAT courses 111 or higher
   B. BIO 112, 200, 210, 215; PHY 112 or higher–20 hours
   C. BIO 303, 304, 305, 318, 335, 355–20 hours
   D. BIO 425, 426, 437, 498–4 hours
   E. Two of BIO 337, 358, 359, or 360–8 hours
      Four of BIO 301, 312, 315, 316, 321, 324, 336, 356, 357–14–16 hours
   F. No minor is required.

V. Major in Botany–42-44 hours
   1. BIO 112, 211, 215, 337, 358, 359, 360–28 hours
   2. Select three electives (at least one from each group):
      Group A: BIO 304, 318, 321, 355
      Group B: BIO 315, 323, 325
   3. BIO 425, 426, 437, 498–4 hours

   (Majors are required to take CHE 111 from Group A list of laboratory science options in the general core.)

VI. Teacher Licensure in Biology (Grades 6–12)
   A. Major requirements as shown above with General Biology Major to include 316 (or 307 and 309).
   B. Students will take BIO 419 and an additional 300-level elective applicable to biology major in place of BIO 425, 426, 437.
   C. Additional requirements: PHY 111 and 112; CHE 111 and 112; MAT 114 or 208 (in B.S. core); CSC 105; and membership in BIOME.
   D. Professional Education:
      1. Prior to Internship–EDU 150, EDU 305, EDU 358, PSY 213, PSY/SE 230.
      2. Fall of Internship Year–EDU 306, 340, 418, 440
      3. Spring of Internship Year–EDU 441 and 451
      4. CSC 105 is required in the BA core
   E. Completion of applicable portions of the Praxis II.
   F. For additional information, see the Director of Educator Preparation.

VII. Minor in Biology–21–24 hours
   A. BIO 112
   B. Two 200-level BIO courses–8 hours
   C. Three 300-level BIO courses–9–12 hours, no more than 2 may be from BIO 307, 309, 322.

Major in Biology with Discipline-Specific Honors

The Biology Discipline-Specific Honors program offers advanced training in laboratory and library research through completion of contract courses with expanded requirements, an original research project, as well as colloquium attendance.

Application Timeline/Process
- At least three full semesters, preferably four, must remain before graduation
- Applications are submitted to the Office of the Director of the Honors Community after the student has met with the Chair of the Department of Biology

Admission Requirements
- Minimum GPA of 3.50 both overall and in Biology
- Completion of at least one semester at Union prior to application
- Completion of 16 credit hours applicable toward the Biology major including BIO 112 and at least one 300-level BIO course.

Progression
- Maintain at least a 3.50 GPA both overall and in Biology
- Complete each honors contract course with a B or better

A one-time, one-semester probation will be allowed to correct a deficient GPA. If the deficiency is not corrected, the student will be dismissed from the Honors program. A one-time, one-semester probation also will be allowed for students failing to meet other expectations, as determined by their thesis advisor and/or Biology Chair. Appeals may be instituted by students in the manner stipulated in the Student Handbook. Application forms may be obtained from the Department Chair.

Honors Requirements

Accepted students will
1. Complete 12 hours of contract courses, selected from among the 300-level biology courses that count toward the Biology major, by entering into a contract with the instructor of each 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

320. Immunology (4) F
Prerequisites: BIO 112, 211, and 4 hours applicable to the BIO major; CHE 314/324 is recommended.

359. Dendrology (4) F-Even Years
Prerequisites: 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) As Needed
Prerequisites: BIO 112, 215 and 4 hours applicable to the BIO major. BIO 210 is strongly recommended.
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 portions of the class will involve insect collection and identification, along with the evaluation of positive and negative impacts of insects on plants. Three hours lecture and 3 hours laboratory/week.

419. Research Experience for Educators (2) S
Prerequisites: EDU 305; Junior Standing; 20 hours applicable to the Biology major; Minimum BIO GPA 2.0.
An introduction to the skills necessary to conduct scientific research. Each student will develop a research question and explore research addressing that questions. Students will attend all scheduled presentations. Course is not available by audit.

425. Introduction to Research (1) F, S
Prerequisites: Junior Standing, 20 hours applicable to the BIO major, minimum BIO GPA of 2.0.
An introduction to the skills necessary to conduct scientific research, prepare a manuscript and make a presentation at a scientific meeting. Each student will develop and submit a research proposal for approval. Students will attend all scheduled presentations. Course not available by audit.

426. Research Experience I (1) F, S
Prerequisites: BIO 425 or 415, minimum BIO GPA of 2.0.
Individual research in accordance with the proposal developed and approved in 425. Students will attend all scheduled presentations. Course is not available by audit. Students may only take this course during winter or summer if the student is also registered for Short Term Research Experience (428) for course during

Restoration Ecology (4)
Ecological and theoretical foundations for ecosystem and biotic community restoration. This course develops ecological principles for ecosystem restoration and applies them to redeeming and restoring degraded and damaged ecosystems and endangered species. Field studies include analysis of restoration and rehabilitation work with the Kirtland Warbler, an officially designated wild river, coastal dunes, kettle-hole bogs, deforested lands, degraded residential and farming sites, and abandoned oil wells. A practical field laboratory is included in which techniques are applied to a specific site. Prerequisite: one year of biology and one course in ecology or field biology, or permission of professor.

179-279-379-479. External Domestic Study Programs (1-3) As Needed
All courses and their applications must be defined and approved prior to registering.

179PF-279PF-379PF-479PF. External Domestic Study Programs (Pass/Fail) As Needed
All courses and their applications must be defined and approved prior to registering.

180-280-380-480. Study Abroad Programs (1-4)
All courses and their application must be defined and approved prior to travel.

180PF-280PF-380PF-480PF. Study Abroad Programs (Pass/Fail) As Needed
All courses and their applications must be defined and approved prior to travel.

195-6-7. Special Studies (1-4)
295-6-7. Special Studies (1-4)
Lower-level group studies that do not appear in the regular departmental offerings.

395-6. Special Studies (1-4)
Upper-level group studies that do not appear in the regular departmental offerings.

397. Special Studies in Cell and Molecular Biology (3)
F or S
Upper-level group studies that do not appear in the regular departmental offerings.

495-6-7. Independent Study (1-4)
Individual research under the guidance of a faculty member(s).