

Biology (PhD)

Degree Requirements

Students may choose from the degree tracks below to complete coursework within a focus area.

Degrees earned will be distributed as: "Doctor of Philosophy in Biology" without track specifications.

Code	Title	Hours	Counts towards
Core Courses		3	
AEC 502	Introduction to Biological Research		
PHI 816	Introduction to Research Ethics		
Additional Courses		69	
"Additional Courses" are determined in conjunction with the academic committee to meet the 72 total hours			
Total Hours		72	

Aquaculture and Aquatic Sciences Track

Code	Title	Hours	Counts towards
Quantitative Requirement		3	
Select one of the following courses:			
ST 511	Statistical Methods For Researchers I		
or ST 512	Statistical Methods For Researchers II		
BIT 815	Advanced Special Topics ²		
AEC 510	Machine Learning Approaches in Biological Sciences		
ST 505	Applied Nonparametric Statistics		
BMA 567	Modeling of Biological Systems		
Restricted Elective		6	
Select two of the following courses:			
AEC/ENT 509	Ecology and Conservation of Freshwater Invertebrates		
AEC 515	Fish Physiology		
AEC 519	Freshwater Ecology		
AEC 624	Advanced Fisheries Science		

AEC 592	Special Topics in Applied Ecology (Management of Small Impoundments)		
AEC 592	Special Topics in Applied Ecology (Aquatic Plant Ecology)		
AEC 592	Special Topics in Applied Ecology (Advanced Biology of Fishes)		
AEC 624	Advanced Fisheries Science		
AEC 710	Sampling Animal Populations		
AEC 726	Quantitative Fisheries Management		
BMA 772	Biomathematics II		
FW 511	Human Dimensions of Wildlife and Fisheries		
MEA 549	Principles of Biological Oceanography		
NR 595	Special Topics in Natural Resources		
TOX 715	Environmental Toxicology		
ZO 524			
Total Hours		9	

² BIT 815 or any Bioinformatics course determined in conjunction with the academic committee.

Molecular, Cellular and Developmental Biology Track

Code	Title	Hours	Counts towards
Quantitative Biology Requirement		3	
Select one of the following courses:			
ST 511	Statistical Methods For Researchers I		
or ST 512	Statistical Methods For Researchers II		
BIT 815	Advanced Special Topics ²		

AEC 510 Machine Learning Approaches in Biological Sciences

Restricted Elective 3

Select one course from the following:

BIO 592 Topical Problems (Capstone Course in Molecular, Cellular, and Developmental Biology)

GN 701 Molecular Genetics

GN 702 Cellular and Developmental Genetics

GN 750 Developmental Genetics

Biotechnology Requirement 4

Select one course below determined in conjunction with the academic committee based on thesis research

BIT 510 Core Technologies in Molecular and Cellular Biology

BIT 595 Special Topics

Total Hours 10

² BIT 815 or any Bioinformatics course determined in conjunction with the academic committee.

Ecology and Evolution Track

Code Title Hours Counts towards

Quantitative Requirement 3

ST 511 Statistical Methods For Researchers I

or ST 512 Statistical Methods For Researchers II

AEC 510 Machine Learning Approaches in Biological Sciences

ST 505 Applied Nonparametric Statistics

BMA 567 Modeling of Biological Systems

Ecology Requirement 3

AEC 503 Foundations of Ecology

AEC 519 Freshwater Ecology

AEC 718 Community Ecology

AEC 761 Conservation and Climate Science

BIO/BMA 560 Population Ecology

MEA 752 Marine Plankton Ecology

Evolution Requirement 3

BIO 570 Evolutionary Ecology

ENT 591 Special Topics In Entomology

GN 703 Population and Quantitative Genetics

GN 713 Quantitative Genetics and Breeding

GN 740 Evolutionary Genetics

GN 757 Quantitative Genetics Theory and Methods

PB 503 Systematic Botany

PB 545 Paleobotany

Total Hours 9

Forensic Sciences Track

Code Title Hours Counts towards

Restricted Electives 4

BIO 520 Skeletal Biological Laboratory Methods in Human Identification & Cold Cases

BIO 811 Forensic Sciences Seminar

Quantitative Requirements 9

ST 511 Statistical Methods For Researchers I

ST 512 Statistical Methods For Researchers II

ST 540 Applied Bayesian Analysis

Total Hours 13

OTHER REQUIREMENTS

- Every student is required to complete training logs. Many of the modules can be completed while taking the BIO 520 course. Please contact the Forensic Sciences Concentration Chair for additional information.
- Students are also required to start the Training Case Record Form after their first year and/or after taking BIO 520, whichever comes first. Please contact the Forensic Sciences Concentration Chair for additional information.
- Forensic Anthropology Society of Europe Level II Certification is strongly recommended but not required- costs associated with this exam are the student's responsibility.

Physiology and Behavior Track

Code	Title	Hours	Counts towards
Quantitative Biology Requirement			3
ST 511	Statistical Methods For Researchers I		
or ST 512	Statistical Methods For Researchers II		
BIT 815	Advanced Special Topics ¹		
AEC 510	Machine Learning Approaches in Biological Sciences		
ST 505	Applied Nonparametric Statistics		
BMA 567	Modeling of Biological Systems		
Restricted Electives			6
Select two of the following courses:			
AEC/ENT 509	Ecology and Conservation of Freshwater Invertebrates		
AEC 515	Fish Physiology		
AEC 519	Freshwater Ecology		
AEC 624	Advanced Fisheries Science		
AEC 592	Special Topics in Applied Ecology (Management of Small Impoundments)		
AEC 592	Special Topics in Applied Ecology (Aquatic Plant Ecology)		
AEC 592	Special Topics in Applied Ecology (Advanced		

	Biology of Fishes)		
AEC 624	Advanced Fisheries Science		
AEC 710	Sampling Animal Populations		
AEC 726	Quantitative Fisheries Management		
BMA 772	Biomathematics II		
FW 511	Human Dimensions of Wildlife and Fisheries		
MEA 549	Principles of Biological Oceanography		
NR 595	Special Topics in Natural Resources		
TOX 715	Environmental Toxicology		
ZO 524			
Additional Courses		63	
Additional courses are determined in conjunction with the academic committee to meet the 72 total hours			
Total Hours		72	

- ¹ Students may take PHI 816 Introduction to Research Ethics or equivalent to meet this requirement.

Integrative Biology Track

This concentration is open to MS and PhD students who do not fit academically within the other Biology concentrations, or who integrate across multiple concentrations. Coursework is determined in consultation with your PhD mentor and committee and is approved by the DGP.

Adjunct Professors

David Derek Aday

Betty L. Black

Russell J. Borski

David Buchwalter

Jeffrey A. Buckel

Ignazio Carbone

Jaime A. Collazo

William Gregory Cope

Harry Valentine Daniels III

Robert R. Dunn

David B. Eggleston	Louis Broaddus Daniel III
John R. Godwin	Miles Dean Engell
Kevin Gross	Miriam G. Ferzli
Craig A. Harms	Jesse Robert Fischer
Jeffrey M. Hinshaw	Terry Allen Gates
Rebecca Elizabeth Irwin	William Miller Johnstone III
Christian Farrell Kammerer	Jane L. Lubischer
Thomas J. Kwak	Erin Alison McKenney
Thomas M. Losordo	Lisa M. Paciulli
Carolyn Jane Mattingly	Lisa D. Parks
Heather B. Patisaul	Martha Burford Reiskind
Luis Alonso Ramirez-Ulate	Damian Shea
Ann Helen Ross	Adrian Alan Smith
Mary Higby Schweitzer	Lindsay E. Zanno
David R. Tarpy	Peter T. Bromley
Scott M. Belcher	Billy J. Copeland
Shobhan Gaddameedhi	Frederick T. Corbin
Adam Hartstone-Rose	Phillip D. Doerr
Randall Brian Langerhans	William C. Grant
John Edward Meitzen	Robert M. Grossfeld
Nanette M. Nascone-Yoder	Thurman L. Grove
Marianne Niedzlek-Feaver	Harold F. Heatwole
Antonio Planchart	Joseph E. Hightower
Reade Bruce Roberts	Richard A. Lancia
Jie Cao	Richard L. Noble
Khara Deanne Grieger	Kenneth H. Pollock
Nathan James Hostetter	James Alan Rice Jr.
Kurt Marsden	John F. Roberts
Jamian Krishna Pacifici	Damian Shea
Seema Nayan Sheth	Theodore R. Simons
Caitlin Suzanne Smukowski Heil	Herbert A. Underwood
Joy Little Snowden	John G. Vandenberg
Bradley William Taylor	Thomas G. Wolcott
Christopher Scott Walker	Robert R. Anholt
Elsa Youngsteadt	Tyler Ray Black
Jennifer L. Campbell	Arthur E. Bogan

Heather Evans

John G. Boreman Jr.

David T. Cobb

Louis Broaddus Daniel III

Mitchell J. Eaton

John Jeffrey Govoni

Nicholas M. Haddad

Andrew Bittinger Heckert

Ryan J. Heise

Corinne J. Kendall

Reid W. Laney

Trudy F. MacKay

Alexa J. McKerrow

Gerard McMahon

James Adiel Morris Jr.

Jennifer R Runkle

Megan Elizabeth Serr

Rowland M. Shelley

Kyle W. Shertzer

Adrian Alan Smith

Seth Patrick Stapleton

Bryan Lynn Stuart

Adam J. Terando