Biology (MS)

Degree Requirements

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

Degrees earned will be distributed as: "Master of Science" without track specifications.

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
<th>Counts towards</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Core Courses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>AEC 502</td>
<td>Introduction to Biological Research</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>PHI 816</td>
<td>Introduction to Research Ethics (or equivalent ethics course)</td>
<td>1</td>
<td></td>
</tr>
</tbody>
</table>

Additional Courses | 27

Additional Courses are determined in conjunction with the academic committee to meet the 30 total hours.

Total Hours | 30

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

Aquaculture and Aquatic Sciences Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantitative Requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST 511</td>
<td>Statistical Methods For Researchers I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or ST 512</td>
<td>Statistical Methods For Researchers II</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BIT 815</td>
<td>Advanced Special Topics</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>AEC 510</td>
<td>Machine Learning Approaches in Biological Sciences</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ST 505</td>
<td>Applied Nonparametric Statistics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BMA 567</td>
<td>Modeling of Biological Systems</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

Restricted Elective | 3

Select one of the following courses:

AEC/ENT 509 | Ecology and Conservation of Freshwater Invertebrates | 3 |                |

Molecular, Cellular and Developmental Biology Track

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Quantitative Biology Requirement</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ST 511</td>
<td>Statistical Methods For Researchers I</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>or ST 512</td>
<td>Statistical Methods For Researchers II</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

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

Select one course from the following:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
<th>Counts towards</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 592</td>
<td>Topical Problems (Capstone Course in Molecular, Cellular, and Developmental Biology)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GN 701</td>
<td>Molecular Genetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GN 702</td>
<td>Cellular and Developmental Genetics</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GN 750</td>
<td>Developmental Genetics</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Ecology or Evolution Requirement

Select one of the following courses from "Ecology" or "Evolution"

**Ecology**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AEC 503</td>
<td>Foundations of Ecology</td>
</tr>
<tr>
<td>AEC 519</td>
<td>Freshwater Ecology</td>
</tr>
<tr>
<td>AEC 718</td>
<td>Community Ecology</td>
</tr>
<tr>
<td>AEC 761</td>
<td>Conservation and Climate Science</td>
</tr>
<tr>
<td>BIO/BMA 560</td>
<td>Population Ecology</td>
</tr>
<tr>
<td>MEA 752</td>
<td>Marine Plankton Ecology</td>
</tr>
</tbody>
</table>

**Evolution**

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 570</td>
<td>Evolutionary Ecology</td>
</tr>
<tr>
<td>ENT 591</td>
<td>Special Topics In Entomology</td>
</tr>
<tr>
<td>GN 703</td>
<td>Population and Quantitative Genetics</td>
</tr>
<tr>
<td>GN 713</td>
<td>Quantitative Genetics and Breeding</td>
</tr>
<tr>
<td>GN 740</td>
<td>Evolutionary Genetics</td>
</tr>
<tr>
<td>GN 757</td>
<td>Quantitative Genetics Theory and Methods</td>
</tr>
<tr>
<td>PB 503</td>
<td>Systematic Botany</td>
</tr>
<tr>
<td>PB 545</td>
<td>Paleobotany</td>
</tr>
</tbody>
</table>

Total Hours: 6

### Specific Courses

**Biology (MS)**

<table>
<thead>
<tr>
<th>Code</th>
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<tbody>
<tr>
<td>BIT 815</td>
<td>Advanced Special Topics</td>
</tr>
<tr>
<td>AEC 510</td>
<td>Machine Learning Approaches in Biological Sciences</td>
</tr>
<tr>
<td>BMA 567</td>
<td>Modeling of Biological Systems</td>
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**Ecology and Evolution Track**

Select one of the following courses:

**Quantitative Requirement**

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</tr>
<tr>
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<td></td>
<td></td>
</tr>
<tr>
<td>ST 505</td>
<td>Applied Nonparametric Statistics</td>
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Total Hours: 10

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

2
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

Code Title Hours Counts towards

ST 540  Applied Bayesian Analysis  9

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.

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.

Full 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
John R. Godwin
Kevin Gross
Craig A. Harms
Jeffrey M. Hinshaw
Rebecca Elizabeth Irwin
Thomas J. Kwak
Thomas M. Losordo
Carolyn Jane Mattingly
Heather B. Patisaul
Luis Alonso Ramirez-Ulate
Ann Helen Ross  
Mary Higby Schweitzer  
David R. Tarpy  

**Associate Professors**  
Scott M. Belcher  
Shobhan Gaddameedhi  
Adam Hartstone-Rose  
Randall Brian Langerhans  
John Edward Meitzen  
Nanette M. Nascone-Yoder  
Marianne Niedzlek-Feaver  
Antonio Planchart  
Reade Bruce Roberts  

**Assistant Professors**  
Jie Cao  
Khara Deanne Grieger  
Nathan James Hostetter  
Kurt Marsden  
Jamian Krishna Pacifici  
Seema Nayan Sheth  
Caitlin Suzanne Smukowski Heil  
Bradley William Taylor  
Christopher Scott Walker  
Elsa Youngsteadt  

**Practice/Research/Teaching Professors**  
Jennifer L. Campbell  
Louis Broaddus Daniel III  
Miles Dean Engell  
Miriam G. Ferzli  
Jesse Robert Fischer  
Terry Allen Gates  
William Miller Johnstone III  
Jane L. Lubischer  
Erin Alison McKenney  

Lisa M. Pacilli  
Lisa D. Parks  
Martha Burford Reiskind  
Damian Shea  
Adrian Alan Smith  
Lindsay E. Zanno  

**Emeritus Faculty**  
Peter T. Bromley  
Billy J. Copeland  
Frederick T. Corbin  
Phillip D. Doerr  
William C. Grant  
Robert M. Grossfeld  
Thurman L. Grove  
Harold F. Heatwole  
Joseph E. Hightower  
Richard A. Lancia  
Richard L. Noble  
Kenneth H. Pollock  
James Alan Rice Jr.  
John F. Roberts  
Damian Shea  
Theodore R. Simons  
Herbert A. Underwood  
John G. Vandenbergh  
Thomas G. Wolcott  

**Adjunct Professors**  
Robert R. Anholt  
Tyler Ray Black  
Arthur E. Bogan  
John G. Boreman Jr.  
David T. Cobb  
Louis Broaddus Daniel III  
Mitchell J. Eaton