Randy,

The College of Food, Agricultural, and Environmental Sciences is requesting Council on Academic Affairs approval for revision of the Entomology major as outlined in the attached document. We are requesting that these changes be made effective autumn 2018. These proposed changes are based on feedback from current students and faculty, indicating that it is difficult for students to complete all of the required and recommended courses within 4 years. One of the most significant changes is a minor will no longer be required and will be replaced with a requirement of a minor equivalent. This is being done to give students more opportunity to take additional courses related to the major. The number of free electives has been increased to allow students to complete a minor if desired.

This proposal has been approved by the faculty of the Department of Entomology and by the College Academic Affairs Committee. Please let me know if any additional information is needed in support of this request.

Steve

**The Ohio State University**

**Steven M. Neal, Ph.D.**
Professor and Interim Associate Dean for Academic Programs
College of Food, Agricultural, and Environmental Sciences
100J Agricultural Administration, 2120 Fyffe Rd. Columbus, OH 43210
Office: 614-688-5612
Fax: 614-292-1218
neal.2@osu.edu
Dr. Steve Neal,  
Interim Associate Dean for Academic Programs  
100 Agricultural Administration  
2120 Fyffe Rd.  
Columbus, Ohio 43210

Thursday, July 09, 2018

Dear Dr. Neal,

The Department of Entomology, within the College of Food, Agricultural, and Environmental Sciences, currently offers seven programs: an undergraduate major in Entomology, an undergraduate minor in Entomology, a Master of Science in Entomology with Plan A (thesis) and Plan B (non-thesis) options, a Doctor of Philosophy in Entomology, a Graduate Minor in Entomology, as well as an undergraduate major in Plant Health Management and a Master in Plant Health Management, which are both in collaboration with the Department of Plant Pathology. The Undergraduate Major in Entomology was approved before semester conversion in 2011, with some minor corrections in 2016. We are now proposing revisions to that program. The attached four documents show the original program submitted in 2010, the existing program, the existing program that is marked to show proposed revisions, and the proposed program. The proposed revisions would take effect Autumn Semester 2018, or at the earliest approved term.

The changes include both changes in curriculum content and changes in the format of how the requirements are presented. We propose seven changes to the program for the major in Entomology for the Bachelor of Science in Agriculture:

1) We are restructuring the current requirement of three courses outside the entomology department (Ecology, Calculus 1, and General Genetics) into an embedded minor, which will be required for students majoring in Entomology. This would then leave more scheduling flexibility for our students to take additional courses related to the major.

2) We are eliminating courses that are no longer being offered due to changes in faculty teaching resources.

3) We are adding courses that have been created since the program was last revised.

4) We have added two 2000 level courses to the list of Entomology electives, with the stipulation that at least 9 of the 12 required credits are at the 3000 level or higher (effectively allowing students to count one of the two 2000 level classes towards the major).

5) We are limiting the number of research credits that can count towards the major to 3 credits.

6) We are removing 6000-level courses from the list of entomology electives, because these are designed for graduate students, not undergraduate students.
7) We are also adding specific courses to the section about suggested courses in related departments; this includes organic chemistry.

To summarize, both the current and the revised curriculum require students to take 36 credit hours related to the major. However, in the current curriculum this only includes 16-18 credit hours of entomology courses and 18-20 credit hours of related courses (e.g. organic chemistry, additional classes in EEOB and SENR) and students have to complete a minor outside of entomology (12-15 additional credits). In contrast, in the revised curriculum, students are able to take 19-20 credit hours of entomology courses and 16-17 credit hours of related courses, and have the minor equivalent built into the program (12 credits). There are an adequate number (15-16) of ‘free electives’ credits that a student has the option to use them to take an additional minor in any subject.

These changes are based on feedback that we have received from current entomology undergraduate students and faculty. We have heard that students majoring in entomology often struggle to fit in all of the required and recommended courses into a 4-year program, especially the students who are preparing for graduate school for which high-credit courses like organic chemistry are recommended.

The faculty in the Department of Entomology discussed and voted on the revisions to the Undergraduate Major in Entomology on June 20, 2018. The vote for the proposed revisions was 14 in favor, 0 opposed, and 1 in abstention. Subsequently, we are forwarding the proposal to the College of Food, Agricultural, and Environmental Sciences for review.

Sincerely,

Dr. Carol Anelli
Professor and Interim Chair
Department of Entomology
### Major Requirements

#### Entomology core required courses:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTMLGY 3000</td>
<td>General Entomology</td>
</tr>
<tr>
<td>ENTMLGY 5601</td>
<td>Sustainable Environmental Management (3)</td>
</tr>
<tr>
<td>or ENTMLGY/PLANT PATH 5604</td>
<td>Capstone Problem-Based Studies Plant Health (2)</td>
</tr>
</tbody>
</table>

#### Required Courses from other departments:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOL GEN 500</td>
<td>General Genetics</td>
</tr>
<tr>
<td>EEOB 503.01</td>
<td>Intro to Ecology, lecture</td>
</tr>
<tr>
<td>MATH 151</td>
<td>Calculus 1</td>
</tr>
</tbody>
</table>

#### Required electives, select one applied course from the following list:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTMLGY 4601</td>
<td>General Insect Pest Management</td>
</tr>
<tr>
<td>ENTMLGY 4602</td>
<td>Landscape Entomology</td>
</tr>
<tr>
<td>ENTMLGY 4603</td>
<td>Agricultural Entomology</td>
</tr>
<tr>
<td>ENTMLGY 4604</td>
<td>Urban Entomology</td>
</tr>
<tr>
<td>ENTMLGY 4605</td>
<td>Public Health Entomology</td>
</tr>
<tr>
<td>ENTMLGY 4606</td>
<td>Forensic Entomology</td>
</tr>
<tr>
<td>ENTMLGY 4607</td>
<td>Veterinary Entomology</td>
</tr>
<tr>
<td>ENTMLGY 5110</td>
<td>Ecology and Management of Pathogens and Insects Affecting Trees in Forest and Urban Environments</td>
</tr>
</tbody>
</table>

#### Required electives, select minimum of 9 credit hours from the list below or additional options from the list above:

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTMLGY 3330 or 4440H</td>
<td>Social Insects</td>
</tr>
<tr>
<td>ENTMLGY 5120</td>
<td>Aquatic Insect Biology &amp; Ecology</td>
</tr>
<tr>
<td>ENTMLGY 5130</td>
<td>Field Insect Taxonomy</td>
</tr>
<tr>
<td>ENTMLGY 5420</td>
<td>Insect Behavior</td>
</tr>
<tr>
<td>ENTMLGY 5500</td>
<td>Biological Control of Insects</td>
</tr>
<tr>
<td>ENTMLGY 5800</td>
<td>Pesticide Science</td>
</tr>
<tr>
<td>ENTMLGY 6310</td>
<td>Insect Physiology &amp; Molecular Biology</td>
</tr>
<tr>
<td>ENTMLGY 6410</td>
<td>Insect Ecology &amp; Evolutionary Processes</td>
</tr>
<tr>
<td>ENTMLGY 6660</td>
<td>Principles &amp; Applications of Integrated Pest Management</td>
</tr>
<tr>
<td>ENTMLGY 6701</td>
<td>Insect Biodiversity Techniques</td>
</tr>
<tr>
<td>ENTMLGY 4683 or 4683H</td>
<td>Research</td>
</tr>
</tbody>
</table>

### Electives related to the major:

Additional courses from those listed above, OR upper level courses in Evolution, Ecology, & Organismal Biology; Molecular Genetics; Plant Cellular & Molecular Biology; Plant Pathology; Microbiology; Horticulture & Crop Science; Environment & Natural Resources; and similar fields.
All students must complete two Global Issues courses in the GE (▲). All students must complete a Social Diversity requirement in the GE, which can be done by completing Rural Sociology 1500 or Sociology 1101.

**FAES 1100 and ENTMLGY 1100**  
5, 5  
**Social Science 1 (RuralSOC 1500 or SOCIOL 1101)**  
3

**Writing Level 1 (English 1110)**  
3  
**Social Science 2 (AEDECON 2001 or ECON 2001)**  
3

**Agr Comm 3310 or Comm 2110**  
3  
**Historical Study (See Approved CFAES GE List)**  
3

**MATH 1150**  
4  
**Culture & Ideas or Historical Study (See Approved CFAES GE List)**  
3

**Data Analysis (Computer 357, AEDE 2055, AgrSci 2260, HCS 2260, ENR 2000, Stat 1450)**  
3  
**Literature (See Approved CFAES GE List)**  
3

**Chem 1210 and 1220**  
10  
**Contemporary Issues (See Approved CFAES GE List)**  
3

**Minor (cannot select a minor in Entomology)**  
12-15

**Major**  
36

**Internship**  
1-2

**Electives**  
12-16

**TOTAL CREDIT HOURS:**  
121

**Minor:** Students in the Applied Pest Management track can minor in any subject, except Entomology. Options range from Crop Science to Public Health to Business Management. Students in a pre-graduate school or pre-medical school or pre-veterinary school track are encouraged to use the Alternative Minor, which will include organic chemistry, calculus 2, and an option for physics.

**Major Requirements**

**Entomology core required courses:**  
5-6

**ENTMLGY 4000 (3000)**  
General Entomology  
3

**ENTMLGY 5601 or ENTMLGY 5604**  
Current Topics in Entomology, Science & Society  
3

**Required courses from Other Departments**  
12

**EEOB 3410**  
Ecology  
4

**MATH 1151**  
Calculus 1  
5

**MOLGEN 4500**  
General Genetics  
3

**Required electives, select one applied course from the following**  
2-3

**ENTMLGY 4601**  
General Insect Pest Management  
2

**ENTMLGY 4602**  
Urban Landscape and Greenhouse Entomology  
2

**ENTMLGY 4603**  
Agricultural Entomology  
2

**ENTMLGY 4606**  
Introduction to Forensic Entomology  
2

**ENTMLGY 4607**  
Veterinary Entomology  
2

**ENTMLGY 5110**  
Ecology and Management of Pathogens and Insects Affecting Trees in Forest and Urban Environments  
3

**Required electives, select a minimum of 9 credit hours from the list below or additional options from the list above**  
9

**ENTMLGY 3330 or 4440H**  
Social Insects / Honors Social Insects  
3

**ENTMLGY 4999 or 4999H**  
Research with Distinction / Honors Research with Distinction  
1-6

**ENTMLGY 5120**  
Aquatic Insect Biology and Ecology (Stone Lab)  
3-4

**ENTMLGY 5130**  
Field Insect Taxonomy  
3

**ENTMLGY 5420**  
Insect Behavior: Mechanisms and Function  
3

**ENTMLGY 5500**  
Biological Control of Arthropod Pests  
3

**ENTMLGY 5600**  
Principles and Applications of Integrated Pest Management  
3

**ENTMLGY 5623**  
Insect Morphology  
2

**ENTMLGY 5797**  
Emerging Arthropods, Pathogens, and Challenges in Vector Biology  
3

**ENTMLGY 5800**  
Pesticide Science  
3

**ENTMLGY 6310**  
Insect Physiology and Molecular Biology  
3

**ENTMLGY 6410**  
Insect Ecology and Evolutionary Processes  
3

**ENTMLGY 6701**  
Biodiversity Analysis for Ecosystems Sustainability and Resilience  
3

**Electives related to the major**  
6-8

Additional Entomology courses at the 6000 level or above OR upper level courses in Evolution, Ecology, and Organismal Biology; Organic Chemistry; Molecular Genetics; Plant Cellular and Molecular Biology; Plant Pathology; Microbiology; Horticulture and Crop Science; Environmental and Natural Resources; and similar fields as chosen in consultation with the adviser.
All students must complete two Global Issues courses in the GE (▲). All students must complete a Social Diversity requirement in the GE, which can be completed by completing Rural Sociology 1500 or Sociology 1101.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAES 1100 and ENTMLGY 1100</td>
<td>General Entomology</td>
<td>5, 5</td>
<td>Social Science 1 (BURLSOC 1500 or SOCIOL 1101)</td>
</tr>
<tr>
<td>Writing Level 1 (English 1110)</td>
<td>Writing Level 2 (2367) or see approved CFAES GE List</td>
<td>3</td>
<td>Social Science 2 (AEDECON 2001 or ECON 2001)</td>
</tr>
<tr>
<td>Agr Comm 3130 or Comm 2110</td>
<td>Agr Comm 1150</td>
<td>4</td>
<td>Historical Study (See Approved CFAES GE List)</td>
</tr>
<tr>
<td>Data Analytics (COM 3577, AEDE 2005, AEB 2260, HCS 2260, ENR 2000, Stat 1450)</td>
<td>Biology 1113 and 1114</td>
<td>8</td>
<td>Culture &amp; Ideas or Historical Study (See Approved CFAES GE List)</td>
</tr>
<tr>
<td>Chem 1210 and 1220</td>
<td>Chemistry 1113 or 1114</td>
<td>10</td>
<td>Literature (See Approved CFAES GE List)</td>
</tr>
</tbody>
</table>

**Major Requirements**

**Entomology core required courses:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTMLGY 4000 (3000)</td>
<td>General Entomology</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5601 or 5602</td>
<td>Current Topics in Entomology, Science &amp; Society</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5604</td>
<td>Capstone Course: Problem-Based Studies in Plant Health</td>
<td>2-3</td>
<td></td>
</tr>
</tbody>
</table>

**Required courses from Other Departments**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>EEBO 2410</td>
<td>Ecology</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>MATH 1151</td>
<td>Calculus 1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>MOLGEN 4500</td>
<td>General Genetics</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**Required electives course in applied entomology, select one applied course from the following:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTMLGY 4601</td>
<td>General Insect Pest Management</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 4602</td>
<td>Urban Landscape and Greenhouse Entomology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 4603</td>
<td>Agricultural Entomology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 4606</td>
<td>Introduction to Forensic Entomology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 4607</td>
<td>Veterinary Entomology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5110*</td>
<td>Ecology and Management of Pathogens and Insects Affecting Trees in Forest and Urban Environments</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5608</td>
<td>Turfgrass Insect and Mite Pests – Identification, Biology, and Management</td>
<td>2</td>
<td></td>
</tr>
</tbody>
</table>

**Required Entomology electives, select a minimum of 9 credit hours, of which at least 9 credits are at the 3000 level or higher, from the list below or additional options from the list of applied entomology courses above:**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
<th>Credits</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTMLGY 2101</td>
<td>Insects and Human Affairs: Pests, Plagues, Poisons, and Politics</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 2200</td>
<td>Beekeeping</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 3330 or 44401</td>
<td>Social Insects / Honors Social Insects</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 4999 or 49991</td>
<td>Research with Distinction / Honors Research with Distinction [limit 3 credit towards the major]</td>
<td>1-6</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5120</td>
<td>Aquatic Insect Biology and Ecology (Stone Lab)</td>
<td>3-4</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5001*</td>
<td>Entomological and Environmental Approaches to Fly Fishing</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5350.01</td>
<td>Taxonomy and Behavior of Aquatic Invertebrates</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5120</td>
<td>Field Insect Taxonomy</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5420*</td>
<td>Insect Behavior: Mechanisms and Function</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5500</td>
<td>Biological Control of Arthropod Pests</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5600</td>
<td>Principles and Applications of Integrated Pest Management</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5623</td>
<td>Insect Morphology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5707</td>
<td>Emerging Arthropods, Pathogens, and Challenges in Vector Biology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 5800</td>
<td>Pesticide Science</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 6310</td>
<td>Insect Physiology and Molecular Biology</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 6410</td>
<td>Insect Ecology and Evolution Processes</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>ENTMLGY 6701</td>
<td>Biodiversity Analysis for Ecosystems Sustainability and Resilience</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

* offered once every 2 years
† only offered at the Wooster location

**Electives related to the major, select a minimum of 16 credit hours, as chosen in consultation with the advisor, such as:**

For students in the Insect Science track (pre-graduate school or pre-medical school or pre-veterinary school):

- CHEM 2510 Organic Chemistry I, 4 credits
- CHEM 2520 Organic Chemistry II, 4 credits
- CHEM 2540 Organic Chemistry Lab I, 2 credits

For students in the Applied Pest Management track, a minor in any subject, except Entomology, can be taken. Options range from Crop Science to Public Health to Business Management. Students in a pre-graduate school or pre-medical school or pre-veterinary school track are encouraged to use the Alternative Minor, which will include organic chemistry, calculus, and an option for physics.
CHEM 2550 Organic Chemistry Lab II, 2 credits
BIOCHEM 4511 Introduction to Biological Chemistry, 4 credits
MOLGEN 3436 Introductory Plant Physiology, 3 credits
MOLGEN 4700 Molecular Cell and Developmental Biology, 3 credits

For students in the Applied Pest Management track:

CHEM 2310 Introductory Organic Chemistry, 4 credits
HCS 5422 Biology and Management of Weeds and Invasive Plants, 3 credits
PLNTPATH 3001 General Plant Pathology Lecture, 3 credits
PLNTPTH 3002 General Plant Pathology Lab, 2 credits
ENR 3000 Soil Science, 3 credits
ENR 5279 Soil Fertility, 3 credits

Additional Entomology courses at the 6000 level or above OR upper level courses in Evolution, Ecology, and Organismal Biology, Organic Chemistry, Molecular Genetics, Plant Cellular and Molecular Biology, Plant Pathology, Microbiology, Horticulture and Crop Science, Environmental and Natural Resources, and similar fields as chosen in consultation with the adviser.

Required supplemental courses (Minor Equivalent)  12
MATH 1151   Calculus 1  5
EEOB 3410   Ecology  4
MOLGEN 4500   General Genetics  3
All students must complete two Global Issues courses in the GE (▲). All students must complete a Social Diversity requirement in the GE, which can be done by completing Rural Sociology 1500 or Sociology 1101.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>FAES 1100 and ENTMLGY 1100</td>
<td>.5, .5 Social Science 1 (RURLSOC 1500 or SOCIOl 1101)</td>
<td>3</td>
</tr>
<tr>
<td>Writing Level 1 (English 1110)</td>
<td>3 Social Science 2 (AEDECON 2001 or ECON 2001)</td>
<td>3</td>
</tr>
<tr>
<td>Writing Level 2 (2367 or see approved CFAES GE List)</td>
<td>3 Historical Study (See Approved CFAES GE List)</td>
<td>3</td>
</tr>
<tr>
<td>Agr Comm 3310 or Comm 2110</td>
<td>3 Culture &amp; Ideas or Historical Study (See Approved CFAES GE List)</td>
<td>3</td>
</tr>
<tr>
<td>MATH 1150</td>
<td>4 Literature (See Approved CFAES GE List)</td>
<td>3</td>
</tr>
<tr>
<td>Data Analysis (Complete 3537, AEDE 2005, AEDE 2208, HCS 2200, ENR 2000, Stat 1450)</td>
<td>3 Art (See Approved CFAES GE List)</td>
<td>3</td>
</tr>
<tr>
<td>Biology 1113 and 1114</td>
<td>8 Contemporary Issues (See Approved CFAES GE List)</td>
<td>3</td>
</tr>
<tr>
<td>Chem 1210 and 1220</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL CREDIT HOURS:</strong></td>
<td></td>
<td>121</td>
</tr>
</tbody>
</table>

### Major Requirements

#### Entomology core required courses:

- **ENTMLGY 4000** General Entomology: 3 credits
- **ENTMLGY 5604** Capstone Course: Problem-Based Studies in Plant Health: 2 credits

#### Required course in applied entomology, select one course from the following:

- **ENTMLGY 4601** General Insect Pest Management: 2 credits
- **ENTMLGY 4607** Veterinary Entomology: 2 credits
- **ENTMLGY 5110** Ecology and Management of Pathogens and Insects Affecting Trees in Forest and Urban Environments: 3 credits
- **ENTMLGY 5608** Turfgrass Insect and Mite Pests – Identification, Biology, and Management: 2 credits

#### Entomology electives, select a minimum of 12 credit hours of which at least 9 credits are at the 3000 level or higher, from the list below, or additional options from the list of applied entomology courses above:

- **ENTMLGY 2101** Insects and Human Affairs: Pests, Plagues, Poisons, and Politics: 3 credits
- **ENTMLGY 2200** Beekeeping: 3 credits
- **ENTMLGY 3330 or 4440H** Social Insects / Honors Social Insects: 3 credits
- **ENTMLGY 4999 or 4999H** Research with Distinction / Honors Research with Distinction [limit 3 credit towards the major]: 1–6 credits
- **ENTMLGY 5001** Entomological and Environmental Approaches to Fly Fishing: 3 credits
- **ENTMLGY 5350.01** Taxonomy and Behavior of Aquatic Invertebrates: 3 credits
- **ENTMLGY 5420** Insect Behavior: Methods and Function: 3 credits
- **ENTMLGY 5500** Biological Control of Arthropod Pests: 3 credits
- **ENTMLGY 5600** Principles and Applications of Integrated Pest Management: 3 credits
- **ENTMLGY 5800** Pesticide Science: 3 credits

* offered once every 2 years
† only offered at the Wooster location

#### Electives related to the major, select a minimum of 16 credit hours, as chosen in consultation with the advisor, such as:

- CHEM 2510 Organic Chemistry I, 4 credits
- CHEM 2520 Organic Chemistry II, 4 credits
- CHEM 2540 Organic Chemistry Lab I, 2 credits
- CHEM 2550 Organic Chemistry Lab II, 2 credits
- CHEM 4511 Introduction to Biological Chemistry, 4 credits
- MOLGEN 3436 Introductory Plant Physiology, 3 credits
- MOLGEN 4700 Molecular Cell and Developmental Biology, 3 credits

#### Required supplemental courses (Minor Equivalent)

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 1151</td>
<td>Calculus 1</td>
<td>5</td>
</tr>
<tr>
<td>EEBO 3410</td>
<td>Ecology</td>
<td>4</td>
</tr>
<tr>
<td>MOLGEN 4500</td>
<td>General Genetics</td>
<td>3</td>
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For students in the Insect Science track (pre-graduate school or pre-medical school or pre-veterinary school):

- CHEM 2510 Organic Chemistry I, 4 credits
- CHEM 2520 Organic Chemistry II, 4 credits
- CHEM 2540 Organic Chemistry Lab I, 2 credits
- CHEM 2550 Organic Chemistry Lab II, 2 credits
- CHEM 4511 Introduction to Biological Chemistry, 4 credits
- MOLGEN 3436 Introductory Plant Physiology, 3 credits
- MOLGEN 4700 Molecular Cell and Developmental Biology, 3 credits

For students in the Applied Pest Management track:

- CHEM 2310 Introductory Organic Chemistry, 4 credits
- HCS 5422 Biology and Management of Weeds and Invasive Plants, 3 credits
- PLNTPATH 3001 General Plant Pathology Lecture, 3 credits
- PLNTPATH 3002 General Plant Pathology Lab, 2 credits
- ENR 3000 Soil Science, 3 credits
- ENR 5279 Soil Fertility, 3 credits

#### Required supplemental courses (Minor Equivalent)

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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
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<tr>
<td>MATH 1151</td>
<td>Calculus 1</td>
<td>5</td>
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<tr>
<td>EEBO 3410</td>
<td>Ecology</td>
<td>4</td>
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<tr>
<td>MOLGEN 4500</td>
<td>General Genetics</td>
<td>3</td>
</tr>
</tbody>
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