

# BIOLOGICAL SCIENCE OF INSECTS

This biological science includes the study of insects, mites, ticks, spiders, and nematodes. These creatures can have both helpful and harmful effects on our food, environment, and health. Entomology and Nematology students study ecology, medically significant arthropods, social insects, insect management, physiology, behavior, evolution, natural ecosystem cycles, and systematics.

## About this Program

- **College:** Agricultural and Life Sciences (<http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/>)
- **Degree:** Bachelor of Science
- **Specializations:** Biological Science of Insects (p. 1) | Preprofessional ([http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/ENY\\_BS/ENY\\_BS04/](http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/ENY_BS/ENY_BS04/)) | Urban Pest Management ([http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/ENY\\_BS/ENY\\_BS07/](http://catalog.ufl.edu/UGRD/colleges-schools/UGAGL/ENY_BS/ENY_BS07/))
- **Credits for Degree:** 120

To graduate with this major, students must complete all university, college, and major requirements.

## Department Information

The Entomology and Nematology Department prepares students for exciting careers in a variety of fields. Entomology and Nematology majors can enter medical, dental, or veterinary school; progress to graduate study in any of several biological sciences such as ecology, nematology, entomology, horticulture, or zoology; or move directly to a variety of careers in fields such as pest management, ecotourism, or biosecurity.

**Website** (<http://entomology.ifas.ufl.edu/>)

## CONTACT

Email ([baldwinr@ufl.edu](mailto:baldwinr@ufl.edu)) | 352.273.3923

P.O. Box 110620

1881 Natural Area Drive, Bldg. 970

STEINMETZ HALL

GAINESVILLE FL 32611-0620

Map (<http://campusmap.ufl.edu/#/index/0970>)

## Curriculum

- Beekeeping Certificate
- Bioinformatics Minor UF Online
- Combination Degrees
- Entomology and Nematology
- Entomology and Nematology Minor
- Entomology and Nematology Minor UF Online
- Landscape Pest Management Certificate
- Medical Entomology Certificate
- Pest Control Technology Certificate
- Urban Pest Management Certificate

The Department of Entomology and Nematology offers the major. Faculty within the department cover areas in systematics, ecology, medically significant arthropods, social insects, insect management, physiology, behavior, evolution and natural ecosystem cycles. The department has a long tradition of sending students to medical, veterinary and dental school. Graduate school prospects are also high and employment options using entomology are versatile.

## Biological Science of Insects

This option prepares students for entry to entomological careers and to graduate school. Except with undergraduate coordinator permission, students are expected to complete the following courses on campus; other ENY courses can be taken online:

Code	Title	Credits
ENY 3005	Principles of Entomology	2
ENY 3005L	Principles of Entomology Laboratory	1
ENY 4161	Insect Classification	3
ENY 4660	Medical and Veterinary Entomology	2
ENY 4660L	Medical and Veterinary Entomology Laboratory	1

Minimum grades of C are required for all core courses. Students must maintain a 2.0 cumulative GPA for specialization electives with no individual course grade less than C-.

## Critical Tracking

Critical Tracking records each student's progress in courses that are required for progress toward each major. Please note the critical-tracking requirements below on a per-semester basis.

Equivalent critical-tracking courses as determined by the State of Florida Common Course Prerequisites (<http://www.flvc.org/cpp/displayRecord.jsp?cip=260702&track=01>) may be used for transfer students.

### Semester 1

- Complete 2 of 5 critical-tracking courses, excluding labs: BSC 2010/BSC 2010L or BOT 2010C, BSC 2011/BSC 2011L, CHM 2045/CHM 2045L, CHM 2046/CHM 2046L, MAC 1147
- 2.5 GPA on math and science courses
- 2.0 UF GPA required

### Semester 2

- Complete 1 additional critical-tracking course, excluding labs
- 2.5 GPA on math and science courses
- 2.0 UF GPA required

### Semester 3

- Complete 1 additional critical-tracking course, excluding labs
- 2.5 GPA on math and science courses
- 2.0 UF GPA required

### Semester 4

- Complete 1 additional critical-tracking course, excluding labs
- 2.5 GPA on math and science courses
- 2.0 UF GPA required

### Semester 5

- Complete all critical-tracking courses, including labs
- 2.5 GPA on math and science courses
- 2.0 UF GPA required
- 2.0 upper division GPA required

### Semester 6

- Complete 2 major elective courses, excluding labs: ALS 4161, ALS 4162, ALS 4163, ENY 4660, ENY 4573, ENY 4453, ENY 4210, ENY 3510C, ENY 3225C, IPM 3022, PMA 4570C
- 2.0 UF GPA required
- 2.0 upper division GPA required

### Semester 7

- Complete 1 additional major elective course, excluding labs
- 2.0 UF GPA required
- 2.0 upper division GPA required

### Semester 8

- Complete a minimum of 3 credits of ENY 4911 or ENY 4230
- 2.0 UF GPA required
- 2.0 upper division GPA required

## Model Semester Plan

All entomology majors in this specialization must take three credits of ENY 4905 or ENY 4911. See advisor for details.

To remain on track, students must complete the appropriate critical-tracking courses, which appear in bold. These courses must be completed by the terms as listed above in the Critical Tracking criteria.

*This semester plan represents an example progression through the major. Actual courses and course order may be different depending on the student's academic record and scheduling availability of courses. Prerequisites still apply.*

Course	Title	Credits
<b>Semester One</b>		
Select one:		3-4
BSC 2010 & 2010L	Integrated Principles of Biology 1 and Integrated Principles of Biology Laboratory 1 ( <b>Critical Tracking</b> ; State Core Gen Ed Biological Sciences)	
BOT 2010C	Introductory Botany ( <b>Critical Tracking</b> ; Gen Ed Biological Sciences)	
Select one: State Core Gen Ed Composition; Writing Requirement		3
ENC 1101	Expository and Argumentative Writing	
ENC 2210	Technical Writing	
ENC 3254	Professional Writing in the Discipline	
MAC 1147 or MAC 2311	Precalculus Algebra and Trigonometry (State Core Gen Ed Mathematics ( <a href="http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext">http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext</a> ) or Analytic Geometry and Calculus 1	4
State Core Gen Ed Humanities ( <a href="http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext">http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext</a> )		3
<b>Credits</b>		<b>13-14</b>
<b>Semester Two</b>		
Quest 1 (Gen Ed Humanities)		3
Select one:		3-4
AEB 2014	Economic Issues, Food and You	
AEB 3103	Principles of Food and Resource Economics (Gen Ed Social and Behavioral Sciences)	
ECO 2023	Principles of Microeconomics	
BSC 2011 & 2011L	Integrated Principles of Biology 2 and Integrated Principles of Biology Laboratory 2 ( <b>Critical Tracking</b> ; Gen Ed Biological Sciences)	4
STA 2023	Introduction to Statistics 1 (Gen Ed Mathematics )	3
State Core Gen Ed Social and Behavioral Sciences ( <a href="http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext">http://catalog.ufl.edu/UGRD/academic-programs/general-education/#genedcoursestext</a> )		3
<b>Credits</b>		<b>16-17</b>
<b>Semester Three</b>		
Quest 2 (Gen Ed International)		3
AEC 3030C	Effective Oral Communication	3
ENY 3005 & 3005L	Principles of Entomology and Principles of Entomology Laboratory (Gen Ed Biological and Physical Sciences) <sup>1</sup>	3
CHM 2045 & 2045L	General Chemistry 1 and General Chemistry 1 Laboratory ( <b>Critical Tracking</b> ; State Core Gen Ed Biological and Physical Sciences)	4
Gen Ed Composition		3
<b>Credits</b>		<b>16</b>
<b>Semester Four</b>		
CHM 2046 & 2046L	General Chemistry 2 and General Chemistry 2 Laboratory ( <b>Critical Tracking</b> ; Gen Ed Physical Sciences)	4
ENY 4161	Insect Classification <sup>1</sup>	3
Select one: Gen Ed Physical Sciences		3-4
PHY 2004 & 2004L	Applied Physics 1 and Laboratory for Applied Physics 1	
PHY 2020	Introduction to Principles of Physics	
Ecology elective		3-4
<b>Credits</b>		<b>13-15</b>
<b>Semester Five</b>		
AEC 3033C	Research and Business Writing in Agricultural and Life Sciences ( <b>Critical Tracking</b> )	3
ENY 4660 & 4660L	Medical and Veterinary Entomology and Medical and Veterinary Entomology Laboratory ( <b>Critical Tracking</b> ) <sup>1</sup>	3

IPM 3022 or PMA 4570C	Fundamentals of Pest Management <b>(Critical Tracking)</b> or Field Techniques in IPM	3
Select one:		3
ALS 4161	Exotic Species and Biosecurity Issues <b>(Critical Tracking)</b>	
ALS 4162	Consequences of Biological Invasions <b>(Critical Tracking)</b>	
PCB 2441	Biological Invaders	
Select one: Gen Ed Biological		4
MCB 3020 & 3020L	Basic Biology of Microorganisms and Laboratory for Basic Biology of Microorganisms	
MCB 2000 & 2000L	Microbiology and Microbiology Laboratory	
<b>Credits</b>		<b>16</b>
<b>Semester Six</b>		
Select one:		3-4
AGR 3303	Genetics	
PCB 3063	Genetics	
PCB 4674	Evolution	
Select one:		3
ENY 4455C	Social Insects <b>(Critical Tracking)</b>	
ENY 4573	Beekeeping I <b>(Critical Tracking)</b>	
ENY 4210	Insects and Wildlife	
Select one:		3
ALS 4163	Challenges in Plant Resource Protection <b>(Critical Tracking)</b>	
ENY 3225C	Principles of Urban Pest Management <b>(Critical Tracking)</b>	
ENY 3510C	Turf and Ornamental Entomology <b>(Critical Tracking)</b>	
Gen Ed Diversity		3
Gen Ed Social and Behavioral Sciences		3
<b>Credits</b>		<b>15-16</b>
<b>Semester Seven</b>		
Select one:		3
ENY 4905	Problems in Entomology	
ENY 4911	Supervised Research in Entomology <b>(Critical Tracking)</b>	
Select one:		3
PLP 3002C	Fundamentals of Plant Pathology	
PLS 3004C	Principles of Plant Science	
PLS 4601C	Principles of Weed Science	
Approved electives <sup>2</sup>		6
Entomology elective		3
<b>Credits</b>		<b>15</b>
<b>Semester Eight</b>		
Select one:		3
ENY 4905	Problems in Entomology	
ENY 4911	Supervised Research in Entomology	
NEM 3002	Principles of Nematology	3
Entomology elective		4
Approved electives <sup>2</sup>		6
<b>Credits</b>		<b>16</b>
<b>Total Credits</b>		<b>120</b>

<sup>1</sup> Must be taken on campus.

<sup>2</sup> Pre-vet majors need appropriate animal science requirements as electives.

## Ecology Electives

Code	Title	Credits
ALS 3153	Agricultural Ecology	3
ENY 4202	Ecology of Vector-Borne Disease	2
ENY 4453	Behavioral Ecology and Systematics	3

PCB 4043C	General Ecology	4
WIS 3401	Wildlife Ecology and Management	3

## Academic Learning Compact

The entomology and nematology curriculum develops an excellent knowledge base and an understanding of concepts and fundamental practices. Through formal courses, laboratory experimentation and individual research experience, students will learn how the scientific method is applied to the biological world at the whole organism and population levels. Students will learn to evaluate hypotheses, to acquire and interpret experimental data, and to communicate results effectively in appropriate styles. Special focus will be information on insect identification, morphology, behavior, physiology and ecology.

## Before Graduating Students Must

- Pass the entomology and nematology competency exam, which will be tailored to individual specializations.
- Complete requirements for the baccalaureate degree, as determined by faculty.

## Students in the Major Will Learn to

### Student Learning Outcomes (SLOs)

#### Content

1. Identify insects and describe and explain insect morphology, physiology and behavior.

#### Critical Thinking

2. Acquire, analyze and synthesize entomological information.

#### Communication

3. Communicate proficiently in the sciences in oral and written forms.

## Curriculum Map

*I = Introduced; R = Reinforced; A = Assessed*

Courses	SLO 1	SLO 2	SLO 3
AEC 3030C			A
AEC 3033C			A
ENY 3005	I, A	I, A	I
ENY 3005L	A	A	
ENY 4161	R, A		R, A

## Assessment Types

- Assignments
- Exams
- Course grades
- Research collection