ENTOMOLOGY, BS

Entomology is the study of insects, which have dominated the terrestrial planet for more than 350 million years. While entomologists have recognized and named more than one million different species of insects, experts vary widely on the true number of insect species – with estimates ranging from three million to 30 million unique species. At any given moment, 200+ million insects live for every human on Earth; over 70% of all animal species are insects. They have achieved something that has eluded humans – sustainable development. Insects are the primary consumers of plants, yet they are also the dominant pollinators, thus ensuring plant reproduction. They play a critical role in disease transmission yet the service they provide to ecological maintenance is unparalleled.

Entomologists conduct insect-based research in numerous areas ranging from general biology, natural history, systematics, ecology, and behavior, to molecular biology, physiology, and development, to medical and agricultural entomology. Emerging areas include invasive species, biodiversity, pollination ecology, forensics, global health, and genomics. Entomology is a very specific discipline, yet at the same time, an immensely broad and diverse field of study touching a wide array of other subjects. As such, entomological training provides many choices and opportunities for those interested in the diversity of nature. While some entomologists work in the field, others work in the laboratory, classroom, or museum settings.

Students majoring in entomology study in a variety of fundamental and applied fields. Graduates find employment in college and university teaching, community education, research and extension work, state and federal government service, industry, and research institutes.

LEARN THROUGH HANDS-ON, REAL-WORLD EXPERIENCES

Entomology students learn in many field and lab courses, including classes that focus on taxonomy, physiology, parasitology, insects and human culture, issues in global health, and medical entomology. Students can complete their capstone requirement as part of a summer field course. There are also numerous internships and research opportunities available both on and off campus.

BUILD COMMUNITY AND NETWORKS

The UW–Madison Entomology Department is committed to the UW System's (http://www.wisconsin.edu/campuses/) goal to provide Wisconsin's citizens with opportunities to benefit from and contribute to the state's growing "knowledge economy" through the land-grant university three-fold mission of teaching, research and public service.

In the spirit of The Wisconsin Idea (http://www.wisconsinidea.wisc.edu/), Entomology Department faculty and students fulfill the public service mission through entomology outreach engagement. Entomology Department interactions with the surrounding and statewide community encompass a wide range of insect and human affairs from human medical issues such as West Nile Virus and Lyme disease, to forest products and natural resources entomology, integrated pest management programs for agriculture, turf and ornamental and household settings, K-12 primary and secondary school education, and more.

CUSTOMIZE A PATH OF STUDY

Students are often able to customize their program of study by exploring a double major and/or undergraduate certificates based on their unique areas of interest. Both faculty and staff advisors are available to help students choose electives based on their educational and professional goals.

MAKE A STRONG START

Freshmen who are interested in Entomology are encouraged to participate in a First-Year Interest Group (https://figs.wisc.edu/what/) (FIG) program. During fall semesters, the department has historically offered a fascinating FIG titled "Global Biodiversity and the 6th Mass Extinction" where students explore what the immense richness of biodiversity means not only to the human species but to the very health of the planet. This program includes field trips, a museum experience, and other hands-on and experiential learning opportunities to bring concepts and classmates together for an eye-opening journey.

GAIN GLOBAL PERSPECTIVE

The Entomology major is a great choice for students who wish to participate in a study abroad experience. Students can choose from a multitude of destinations worldwide and can travel abroad during summer, spring, or fall terms. Students can explore studying abroad as an Entomology major by utilizing the Entomology Major Advising Page. Students work with their advisor and the CALS study abroad office to identify appropriate programs.

HOW TO GET IN

HOW TO GET IN

Requirements	Details
How to get in	No application required. All students who meet the requirements listed below are eligible to declare. For information on how to declare, visit Advising & Careers.
Courses required to get in	None
GPA requirements to get in	None
Credits required to get in	Must have fewer than 86 credits.
Other	Students who do not meet the requirements above or are not in good academic standing should schedule a meeting with CALS Dean on Call (https://go.wisc.edu/g85h79 (https://go.wisc.edu/g85h79/)) to discuss exceptions.

PROSPECTIVE UW-MADISON STUDENTS

All prospective UW–Madison students must apply through the Office of Admissions and Recruitment (https://www.admissions.wisc.edu/).

Students interested in this major should select it as the first choice major on their UW–Madison application. Admitted students who enroll at UW-Madison and attend Student Orientation, Advising, and Registration (SOAR) with the College of Agricultural and Life Sciences have the option

to declare this major at SOAR. More information is available here (https://cals.wisc.edu/academics/undergraduate/future-students/).

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin-Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (https://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext) section of the Guide.

General Education
- Breadth—Humanities/Literature/Arts: 6 credits
- Breadth—Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits
- Breadth—Social Studies: 3 credits
- Communication Part A & Part B *
- Ethnic Studies *
- Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF AGRICULTURAL AND LIFE SCIENCES REQUIREMENTS

In addition to the University General Education Requirements, all undergraduate students in CALS must satisfy a set of college and major requirements. Courses may not double count within university requirements (General Education and Breadth) or within college requirements (First-Year Seminar, International Studies, Science, and Capstone), but courses counted toward university requirements may also be used to satisfy a college and/or a major requirement; similarly, courses counted toward college requirements may also be used to satisfy a university and/or a major requirement.

COLLEGE REQUIREMENTS FOR ALL CALS BS DEGREE PROGRAMS

Code	Title	Credits
Quality of Work: Students must maintain a minimum cumulative grade point average of 2.000 to remain in good standing and be eligible for graduation.		
Residency: Students must complete 30 degree credits in residence at UW–Madison after earning 86 credits toward their undergraduate degree.		
First year seminar (https://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSFirstYearSeminarCourses)		1
International studies (https://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSInternationalStudiesCourses)		3
Physical science fundamentals		4-5
CHEM 103	General Chemistry I	
or CHEM 108	Chemistry in Our World	
or CHEM 109	Advanced General Chemistry	
Biological science		5
Additional science (biological, physical, or natural)		3
Science breadth (biological, physical, natural, or social)		3
CALS Capstone Learning Experience: included in the requirements for each CALS major (see "major requirements") (https://guide.wisc.edu/undergraduate/agricultural-life-sciences/#CALSCapstoneRequirement)		

MAJOR REQUIREMENTS

Code	Title	Credits
Mathematics		9-11
Chemistry		5-9
Biology		10
Physics		3-5
Biological and Physical Science Electives		12
Entomology Core		15
Capstone		3
Total Credits		**57-65**

MATHEMATICS

Code	Title	Credits
Complete one of the following (or may be satisfied by placement exam):		
MATH 112 & MATH 113	College Algebra and Trigonometry	6
MATH 114	Precalculus	5
MATH 171	Calculus with Algebra and Trigonometry I	5
Complete one of the following:		
MATH 211	Survey of Calculus 1	4
MATH 217	Calculus with Algebra and Trigonometry II	5
MATH 221	Calculus and Analytic Geometry 1	5
STAT 371	Introductory Applied Statistics for the Life Sciences	3

CHEMISTRY

Complete one of the following:

Code	Title	Credits
CHEM 103 & CHEM 104	General Chemistry I and General Chemistry II	9
CHEM 109	Advanced General Chemistry	5

BIOLOGY

Complete one of the following options:

Code	Title	Credits
Option 1:		
BIOLOGY/BOTANY/ ZOOLOGY 151 & BIOLOGY/ BOTANY/ ZOOLOGY 152	Introductory Biology and Introductory Biology	10
Option 2:		
BIOLOGY/ ZOOLOGY 101 & BIOLOGY/ ZOOLOGY 102 & BIOLOGY/ BOTANY 130	Animal Biology and Animal Biology Laboratory and General Botany	10
Option 3:		
BIOCORE 381 & BIOCORE 382 & BIOCORE 383 & BIOCORE 384	Evolution, Ecology, and Genetics and Evolution, Ecology, and Genetics Laboratory and Cellular Biology and Cellular Biology Laboratory	10

PHYSICS

Complete one of the following:

Code	Title	Credits
PHYSICS 103	General Physics	4
PHYSICS 107	The Ideas of Modern Physics	3
PHYSICS 109	Physics in the Arts	3
PHYSICS 115	Energy and Climate	3
PHYSICS 201	General Physics	5
PHYSICS 207	General Physics	5

BIOLOGICAL AND PHYSICAL SCIENCE ELECTIVES

Complete 12 additional credits from any biological or physical science course (at least 8 credits must be numbered 300-399 or 200-299 with the intermediate-level designation). Recommended courses are listed below.

Recommended Biological and Physical Science Electives

Code	Title	Credits
GENETICS 466	Principles of Genetics	3
CHEM 341	Elementary Organic Chemistry	3
CHEM 342	Elementary Organic Chemistry Laboratory	1
CHEM 343	Organic Chemistry I	3
CHEM 344	Introductory Organic Chemistry Laboratory	2
CHEM 345	Organic Chemistry II	3
PHYSICS 104	General Physics	4
PHYSICS 202	General Physics	5
PHYSICS 208	General Physics	5
ENTOM (not used to meet other requirements), BOTANY, ZOOLOGY, F&W ECOL, MICROBIO, or PL PATH.		

ENTOMOLOGY CORE

Code	Title	Credits
ENTOM/ ZOOLOGY 302	Introduction to Entomology	4
Subset Courses		11

Must complete at least 3 credits from at least two subsets (organismal, suborganismal, or applied). Courses may not double count in more than one subset. May complete up to 3 credits from the subset labeled "other." See course lists below.

Organismal

Code	Title	Credits
ENTOM 331	Taxonomy of Mature Insects	4
ENTOM 432	Taxonomy and Bionomics of Immature Insects	4
ENTOM 450	Basic and Applied Insect Ecology	3
ENTOM 468	Studies in Field Entomology	3
ENTOM/BOTANY/ ZOOLOGY 473	Plant-Insect Interactions	3
ENTOM 490	Biodiversity and Global Change	3

Suborganismal

Code	Title	Credits
ENTOM 321	Physiology of Insects	3
ENTOM/ ZOOLOGY 371	Medical Entomology: Biology of Vector and Vector-borne Diseases	3-4
ENTOM/BOTANY/ PL PATH 505	Plant-Microbe Interactions: Molecular and Ecological Aspects	3
ENTOM/GENETICS/ ZOOLOGY 624	Molecular Ecology	3

Applied

Code	Title	Credits
ENTOM 344	From Flowers to Food: Pollinator Ecology and Conservation	3
ENTOM/M M & I/ PATH-BIO/ ZOOLOGY 350	Parasitology	3
ENTOM 351	Principles of Economic Entomology	3
ENTOM/ ZOOLOGY 371	Medical Entomology: Biology of Vector and Vector-borne Diseases	3
ENTOM 450	Basic and Applied Insect Ecology	3

Other

Code	Title	Credits
ENTOM 375	Special Topics	1-4
ENTOM 399	Coordinative Internship/ Cooperative Education	1-8
ENTOM 681	Senior Honors Thesis	2-4
ENTOM 682	Senior Honors Thesis	2-4
ENTOM 691	Senior Thesis	2
ENTOM 699	Special Problems	1-4

CAPSTONE

ENTOM 468 Studies in Field Entomology is the recommended capstone course (can double count in Entomology Core). ENTOM 681 Senior Honors Thesis, ENTOM 682 Senior Honors Thesis, ENTOM 691 Senior Thesis, ENTOM 699 Special Problems can be substituted in special circumstances (and can double count up to 3 credits in Entomology Core Category); see advisor.

Code	Title	Credits
ENTOM 468	Studies in Field Entomology	3

UNIVERSITY DEGREE REQUIREMENTS

Total Degree	To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.
Residency	Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. "In residence" credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.
Quality of Work	Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

LEARNING OUTCOMES

LEARNING OUTCOMES

1. Define and explain major concepts in the biological sciences focusing on insects.
2. Knowledge of laboratory and/or field methodology.
3. Explain and apply scientific methods including designing and conducting experiments and testing hypotheses.
4. Recognize relationships between structure and function at all levels including molecular, cellular, organismal and ecological.
5. Demonstrate a style appropriate for communicating scientific results in written and oral form.
6. Integrate math, physics, and technology to answer biological questions using the scientific method.

FOUR-YEAR PLAN

FOUR-YEAR PLAN

SAMPLE ENTOMOLOGY FOUR-YEAR PLAN

Students must complete at least 120 total credits to be eligible for graduation.

This sample four-year plan is a tool to assist students and their advisors. Students should use their DARS report, the degree planner, Guide requirements, and the course search & enroll tools to make their own four-year plan based on their placement scores, credit for transferred courses and approved examinations, and individual interests.

First Year

Fall	Credits	Spring	Credits
Biology Option or General Chemistry	4-5	Biology Option or General Chemistry	5
COMM A Course	3	MATH 113	3
CALS First Year Seminar	1	Ethnic Studies	3
MATH 112	3	Humanities Breadth	3
Elective	3		
	14		**14**

Second Year

Fall	Credits	Spring	Credits
Biology Option or General Chemistry	4-5	Biology Option or General Chemistry	5
COMM B Course	3	Electives	7
MATH 221	5	Humanities Breadth	3
Elective	3		
	15		**15**

Third Year

Fall	Credits	Spring	Credits	Summer	Credits
ENTOM/ ZOOLOGY 302	4	Biological or Physical Science Elective	3	ENTOM 468	3
Physics Course	3-5	Breadth Course in Core	3		
Electives	7	CALS International Studies Requirement	3		
		Electives	6		
	14		**15**		**3**

Fourth Year

Fall	Credits	Spring	Credits
Biological or Physical Science Elective	3	Biological or Physical Science Electives	6
Breadth Course in Core	3	Breadth Course in Core	3
Electives	6	Electives	6
Social Science Breadth	3		
	15		**15**

Total Credits 120

ADVISING AND CAREERS

ADVISING AND CAREERS

ADVISING

Undergraduate students are assigned to an Entomology undergraduate faculty advisor and academic staff advisor. However, since the vast majority of Entomology BS students conduct independent research during their undergraduate career, it is important to meet with other entomology faculty members (https://entomology.wisc.edu/people/faculty/) to learn about all of the research possibilities.

Undergraduates in Entomology are strongly urged to meet with their advisor before they enroll for the upcoming term. If you have questions about advising or declaring the major, please contact the academic advisor.

CAREER OPPORTUNITIES

Entomologists from all educational levels are able to seek employment in a variety of areas. Graduates find employment in college and university teaching, community education, research and extension work, state and federal government service, industry, and research institutes. Some examples include:

- college and universities
- biotechnology companies
- state and federal agencies
- international agricultural research centers
- nurseries, greenhouses, and garden centers
- non-governmental organizations
- golf courses, public parks, and landscape maintenance companies
- agricultural companies
- a variety of private consulting firms

For more information on careers available to Entomology students, please visit our Internship & Job Resources (https://entomology.wisc.edu/graduate-study/internships-and-job-resources/) page. For more information on other academic, co-curricular, financial aid, and career opportunities and services available to Entomology BS students, please visit the CALS Career Services (https://cals.wisc.edu/academics/undergraduate-students/career-services/) page. Students in the major are welcome to make an individual appointment with their advisor to discuss a number of career-related topics such as career exploration, search strategies, graduate school, and review of application materials (resume, CV, letters, etc.).

WISCONSIN EXPERIENCE

WISCONSIN EXPERIENCE

While entomology clearly is "big science," our department prides itself on a "small campus" feel in which we get to know our undergraduate students during their time with us.

In the classroom, we strive to maintain labs at not more than 15-20 students to maximize individualized and participatory learning. Students are given additional opportunities for deep and engaged learning experiences through honors options that are generally available for most courses and field and/or lab experiences in many of the upper-level courses.

INTERNSHIPS

Please visit our Internships & Job Resources (https://entomology.wisc.edu/graduate-study/internships-and-job-resources/) page for more information on the multitude of internship and employment opportunities available to Entomology students. Research and internship opportunities are also available in the UW Insect Research Collection (WIRC) (http://labs.russell.wisc.edu/wirc/), as well as possible participation in WIRC-sponsored collecting expeditions in Wisconsin and around the United States.

RESEARCH EXPERIENCE

Very nearly all our undergraduate students have opportunities to work alongside our faculty and graduate students in research labs and in the field. Our major accommodates 1–3 credits (of the 15 entomology credits required to major) in the area of directed/independent study and internships to promote extracurricular and outside the traditional classroom learning.

STUDENT ORGANIZATIONS

Undergraduate students are also involved in service learning and teaching through our departmental "Insect Ambassadors (https://entomology.wisc.edu/outreach/insect-ambassadors/)" outreach program to K–12, various clubs, and organizations. We are committed to the UW System goal to provide Wisconsin's citizens with opportunities to benefit from, and contribute to, the state's growing "knowledge economy" through the land-grant university three-fold mission of teaching, research, and public service. We also have an active Undergraduate Entomology Society for majors — or any UW–Madison students interested in entomology.

GLOBAL ENGAGEMENT

Entomology students are encouraged to participate in a study abroad experience. Students can find more information about study abroad on the CALS study abroad advising page (https://cals.wisc.edu/academics/undergraduate-students/international-programs/study-abroad-advising/).

COMMUNITY ENGAGEMENT AND VOLUNTEERING

In the spirit of The Wisconsin Idea (http://www.wisconsinidea.wisc.edu/), Entomology Department faculty and students fulfill the public service mission through entomology outreach engagement. Entomology Department interactions with the surrounding and statewide community encompass a wide range of insect and human affairs from human medical issues such as West Nile Virus and Lyme disease, to forest products and natural resources entomology, integrated pest management programs for agriculture, turf and ornamental and household settings, K-12 primary and secondary school education, and more. Please visit our Outreach (https://entomology.wisc.edu/outreach/) page for more information.

On campus, the Morgridge Center for Public Service (https://morgridge.wisc.edu/) provides resources to help students connect with volunteer opportunities based on their interests and goals.

RESOURCES AND SCHOLARSHIPS

Department scholarships are available to Entomology students and fellowships are available to support research work with a professor. Please visit our Awards & Scholarships (https://entomology.wisc.edu/undergraduate-study/awards-scholarships/) page for additional details. Students across the College of Agricultural and Life Sciences receive more than $1.25 million in scholarships annually. Learn more about college scholarships here (https://cals.wisc.edu/academics/undergraduate-students/financing-your-education/cals-scholarships/).