UNIVERSITY OF MINNESOTA
Driven to Discover℠

Twin Cities Campus

Ecology, Evolution, and Behavior B.S.

Ecology, Evolution & Behavior

College of Biological Sciences

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2023
- Required credits to graduate with this degree: 120
- Required credits within the major: 70 to 79
- Degree: Bachelor of Science

Students majoring in ecology, evolution, and behavior (EEB) focus on three related areas of biology. Ecology examines the growth and maintenance of populations and their interactions in communities, and relationships among organisms and physical events in terrestrial and aquatic ecosystems. Evolution investigates the origin and change of biological diversity by studying evolutionary patterns and processes at various temporal and spatial scales. Behavioral biology explores behavioral adaptations to the environment, mechanisms of behavior, and the evolution of social systems.

A BS in EEB prepares students for graduate study in integrative biology and related biological sciences, careers in teaching, and entry-level scientist positions in industry, government agencies, nonprofit agencies, and universities.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

A GPA above 2.0 is preferred for the following:

- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

General Requirements

All students are required to complete general University and college requirements including writing and liberal education courses. For more information about University-wide requirements, see the liberal education requirements.Required courses for the major or minor in which a student receives a D grade (with or without plus or minus) do not count toward the major or minor (including transfer courses).

Program Requirements

At least 17 upper-division credits in the major must be taken at the University of Minnesota Twin Cities campus.

Foundational Courses

Nature of Life/Nature of Science and Research

BIOL 1805 - Nature of Life: Introducing New Students to the Biological Sciences (0.5 cr)
BIOL 1806 - Nature of Life, Part Two (0.5 cr)
BIOL 1807 - Nature of Life Part III (1.0 cr)
or BIOL 3001 - Nature of Science and Research (1.0 cr)

Foundations of Biology

BIOL 1951 - Foundations of Biology Lecture I for Biological Sciences Majors [BIOL] (4.0 cr)
or BIOL 1951H - Foundations of Biology Lecture I for Biological Sciences Majors [BIOL] (4.0 cr)
BIOL 1961 - Foundations of Biology Lab I for Biological Sciences Majors [BIOL] (2.0 cr)
BIOL 2003 - Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr)
or BIOL 2003H - Foundations of Biology for Biological Sciences Majors, Part II (3.0 cr)
BIOL 3004 - Foundations of Biology for Biological Sciences Majors, Part II Laboratory (3.0 cr)

Quantitative Requirements

MATH 1241 - Calculus and Dynamical Systems in Biology [MATH] (4.0 cr)
or MATH 1271 - Calculus I [MATH] (4.0 cr)
or MATH 1371 - CSE Calculus I [MATH] (4.0 cr)
or MATH 1571H - Honors Calculus I [MATH] (4.0 cr)
Take 1 or more course(s) from the following:
•CSCI 1133 - Introduction to Computing and Programming Concepts (4.0 cr)

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•CSCI 1133H - Honors Introduction to Computing and Programming Concepts (4.0 cr)
•CSCI 3003 - Introduction to Computing in Biology (3.0 cr)
•MATH 1272 - Calculus II (4.0 cr)
•MATH 1572H - Honors Calculus II (4.0 cr)
•MATH 2241 - Mathematical Modeling of Biological Systems (3.0 cr)
•STAT 3011 - Introduction to Statistical Analysis [MATH] (4.0 cr)
•BIOL 3272 - Applied Biostatistics (4.0 cr)
or BIOL 3272H - Applied Biostatistics (4.0 cr)
or BIOL 5272 - Applied Biostatistics (4.0 cr)

Chemistry

Track 1: Preferred CBS Chemistry Sequence

CHEM 1081 - Chemistry for the Life Sciences I [PHYS] (3.0 cr)
CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
CHEM 1082 - Chemistry for the Life Sciences II (3.0 cr)
CHEM 1086 - Chemistry for the Life Sciences II Laboratory (1.0 cr)
CHEM 2081 - Chemistry for the Life Sciences III (3.0 cr)
CHEM 2085 - Chemistry for the Life Sciences III Laboratory (2.0 cr)

or **Track 2**

This track is allowable for students entering CBS with previous chemistry credit, or for whom space is not available in the preferred track. Students should speak with a CBS academic advisor to determine eligibility for this track.

CHEM 1061 - Chemical Principles I [PHYS] (3.0 cr)
CHEM 1065 - Chemical Principles I Laboratory [PHYS] (1.0 cr)
CHEM 1062 - Chemical Principles II [PHYS] (3.0 cr)
CHEM 1066 - Chemical Principles II Laboratory [PHYS] (1.0 cr)
CHEM 2301 - Organic Chemistry I (3.0 cr)
CHEM 2302 - Organic Chemistry II (3.0 cr)
or EEB 4611 - Biogeochemical Processes (3.0 cr)

or **Track 2 (Honors Option)**

This track is allowable for CBS honors students.

CHEM 1071H - Honors Chemistry I [PHYS] (3.0 cr)
CHEM 1075H - Honors Chemistry I Laboratory [PHYS] (1.0 cr)
CHEM 1072H - Honors Chemistry II [PHYS] (3.0 cr)
CHEM 1076H - Honors Chemistry II Laboratory [PHYS] (1.0 cr)
CHEM 2331H - Honors Elementary Organic Chemistry I (3.0 cr)
CHEM 2332H - Honors Elementary Organic Chemistry II (3.0 cr)

Physics

PHYS 1221 - Introductory Physics for Life Science Majors I [PHYS] (4.0 cr)
or PHYS 1301W - Introductory Physics for Science and Engineering I [PHYS, WI] (4.0 cr)
or PHYS 1401V - Honors Physics I [PHYS, WI] (4.0 cr)

CBS Content Areas

At least one course is required from 5 out of the 6 Content Areas. At least one course is required from Content Areas A, B, C, and E.
Take 5 or more sub-requirements(s) from the following:

Content Area A: Ecology

Take exactly 1 course(s) from the following:
•EEB 3407 - Ecology (3.0 cr)
•EEB 3408W - Ecology [WI] (4.0 cr)
•EEB 4609W - Ecosystem Ecology [ENV, WI] (3.0 cr)
•EEB 4611 - Biogeochemical Processes (3.0 cr)
•PMB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)

•Content Area B: Evolution

Take exactly 1 course(s) from the following:
•EEB 3002 - Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr)
•EEB 3409 - Evolution (3.0 cr)
•EEB 5409 - Evolution (3.0 cr)

•Content Area C: Organismal Biology

Take 1 - 2 course(s) from the following:
•BIOL 3012 - Animal Diversity and Evolution (4.0 cr)
•EEB 3412W - Introduction to Animal Behavior, Writing Intensive [WI] (4.0 cr)
•EEB 4129 - Mammalogy (4.0 cr)
•EEB 4134 - Introduction to Ornithology (4.0 cr)
•MICB 3301 - Biology of Microorganisms (5.0 cr)
•MICB 3303 - Biology of Microorganisms (without laboratory) (3.0 cr)
•PMB 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
•PMB 3212 - Fungi - A Kingdom of Their Own (3.0 cr)
•PMB 4111 - Microbial Physiology and Diversity (3.0 cr)

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•PMB 5212 - Fungi - A Kingdom of Their Own (3.0 cr)
•PMB 3002 - Plant Biology: Function (2.0 cr)
PMB 3005W - Plant Function Laboratory [WI] (2.0 cr)

•Content Area D: Biochemistry

Take 0 - 1 course(s) from the following:
•BIOC 3022 - Biochemistry for Life Scientists (3.0 cr)
•BIOC 4331 - Biochemistry I: Structure, Catalysis, and Metabolism in Biological Systems (4.0 cr)

•Content Area E: Genetics

Take exactly 1 course(s) from the following:
•BIOL 4003 - Genetics (3.0 cr)
•PMB 4131 - Prokaryotic Genetics (3.0 cr)

•Content Area F: Cell Biology

Take 0 - 1 course(s) from the following:
•BIOC 4332 - Biochemistry II: Molecular Mechanisms of Signal Transduction and Gene Expression (4.0 cr)
•BIOL 4004 - Cell Biology (3.0 cr)
•MICB 4171 - Biology, Genetics, and Pathogenesis of Viruses (3.0 cr)
•PMB 4516W - Plant Cell Biology: Writing Intensive [WI] (3.0 cr)

Ecology, Evolution and Behavior Core

Take 2 or more sub-requirements(s) from the following:

Ecology
•EEB 3407 - Ecology (3.0 cr)
or EEB 3408W - Ecology [WI] (4.0 cr)
or EEB 3807 - Ecology (4.0 cr)

•Evolution
•EEB 3409 - Evolution (3.0 cr)
or EEB 5409 - Evolution (3.0 cr)

•Animal Behavior
•EEB 3411 - Introduction to Animal Behavior (3.0 cr)
or EEB 3412W - Introduction to Animal Behavior, Writing Intensive [WI] (4.0 cr)
or EEB 3811W - Animal Behavior in the Field [WI] (4.0 cr)

EEB Major Electives

The 12 credits include at least one lab and and one upper-division course. If directed research (4994/4794W) is chosen for the lab/field experience, a minimum of 2 credits of it must be completed to satisfy the lab/field requirement. A maximum of 7 credits of directed research may be used toward a CBS degree.

Take 12 or more credit(s) from the following:

Field/Lab Experience

Take 2 or more credit(s) from the following:
•BIOC 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•BIOC 4994 - Directed Research (1.0 - 7.0 cr)
•BIOL 3012 - Animal Diversity and Evolution (4.0 cr)
•BIOL 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•BIOL 4994 - Directed Research (1.0 - 7.0 cr)
•COP 4794W - Writing Intensive Directed Research [WI] (1.0 - 7.0 cr)
•COP 4994 - Directed Research (1.0 - 7.0 cr)
•EEB 3407 - Ecology (3.0 cr)
•EEB 3408W - Ecology [WI] (4.0 cr)
•EEB 3807 - Ecology (4.0 cr)
•EEB 3811W - Animal Behavior in the Field [WI] (4.0 cr)
•EEB 4129 - Mammalogy (4.0 cr)
•EEB 4134 - Introduction to Ornithology (4.0 cr)
•EEB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•EEB 4839 - Field Studies in Mammalogy (4.0 cr)
•EEB 4844 - Field Ornithology (3.0 cr)
•EEB 4994 - Directed Research (1.0 - 6.0 cr)
•EEB 5534 - Biodiversity Sci: The origins, maintenance, consequences, detection and assessment of biodiversity [ENV] (3.0 cr)
•GCD 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•GCD 4994 - Directed Research (1.0 - 7.0 cr)
•GCD 5111 - Quantitative Fluorescence Microscopy (3.0 cr)
•MICB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•MICB 4994 - Directed Research (1.0 - 7.0 cr)
•NSCI 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•NSCI 4994 - Directed Research (1.0 - 6.0 cr)
•PMB 4321 - Minnesota Flora (3.0 cr)
•PMB 4511 - Flowering Plant Diversity (3.0 cr)

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- PMB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- PMB 4994 - Directed Research (1.0 - 7.0 cr)
- PMB 3802 - Field Microbiology at Itasca Biological Research Station (3.0 cr)
  or PMB 5802 - Field Microbiology at Itasca Biological Research Station (3.0 cr)
- PMB 3812 - Field Mycology (3.0 cr)
  or PMB 5812 - Field Mycology (3.0 cr)

•Upper-Division EEB

Take 1 or more course(s) from the following:

- BIOC 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- BIOC 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- BIOC 4993 - Directed Studies (1.0 - 7.0 cr)
- BIOC 4994 - Directed Research (1.0 - 7.0 cr)
- BIOL 3051 - Genome Editing and Engineering [TS] (3.0 cr)
- BIOL 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- BIOL 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- BIOL 4951H - Thesis Writing in the Biological Sciences: Developing the Literature Review (1.0 cr)
- BIOL 4993 - Directed Studies (1.0 - 7.0 cr)
- BIOL 4994 - Directed Research (1.0 - 7.0 cr)
- COP 4793W - Writing Intensive Directed Studies [WI] (1.0 - 7.0 cr)
- COP 4794W - Writing Intensive Directed Research [WI] (1.0 - 7.0 cr)
- COP 4993 - Directed Studies (1.0 - 7.0 cr)
- COP 4994 - Directed Research (1.0 - 7.0 cr)
- EEB 3500 - Special Topics in Ecology, Evolution and Behavior (1.0 - 3.0 cr)
- EEB 3603 - Science, Protection, and Management of Aquatic Environments (3.0 cr)
- EEB 3701 - EEB Seminar (1.0 cr)
- EEB 3851W - Health and Biodiversity [ENV, WI] (3.0 cr)
- EEB 4068 - Plant Physiological Ecology (3.0 cr)
- EEB 4330W - Animal Communication [WI] (3.0 cr)
- EEB 4611 - Biogeochemical Processes (3.0 cr)
- EEB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- EEB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- EEB 4839 - Field Studies in Mammalogy (4.0 cr)
- EEB 4844 - Field Ornithology (3.0 cr)
- EEB 4993 - Directed Studies (1.0 - 7.0 cr)
- EEB 4994 - Directed Research (1.0 - 6.0 cr)
- EEB 5042 - Quantitative Genetics (3.0 cr)
- EEB 5053 - Ecology: Theory and Concepts (4.0 cr)
- EEB 5068 - Plant Physiological Ecology (3.0 cr)
- EEB 5371 - Principles of Systematics (3.0 cr)
- EEB 5534 - Biodiversity Sci: The origins, maintenance, consequences, detection and assessment of biodiversity [ENV] (3.0 cr)
- EEB 5601 - Limnology (3.0 cr)
- GCD 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- GCD 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- GCD 4993 - Directed Studies (1.0 - 7.0 cr)
- GCD 4994 - Directed Research (1.0 - 7.0 cr)
- MICB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- MICB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- MICB 4993 - Directed Studies (1.0 - 7.0 cr)
- MICB 4994 - Directed Research (1.0 - 7.0 cr)
- NSCI 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 6.0 cr)
- NSCI 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- NSCI 4993 - Directed Studies (1.0 - 7.0 cr)
- NSCI 4994 - Directed Research (1.0 - 6.0 cr)
- PMB 3701 - PMB Seminar (1.0 cr)
- PMB 4121 - Microbial Ecology and Applied Microbiology (3.0 cr)
- PMB 4131 - Prokaryotic Genetics (3.0 cr)
- PMB 4321 - Minnesota Flora (3.0 cr)
- PMB 4511 - Flowering Plant Diversity (3.0 cr)
- PMB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
- PMB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
- PMB 4993 - Directed Studies (1.0 - 7.0 cr)
- PMB 4994 - Directed Research (1.0 - 7.0 cr)
- BIOL 3015 - Molecular Biology (2.0 cr)
  or BIOL 3025 - Molecular Biology and Society [TS] (3.0 cr)
- EEB 3002 - Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr)
  or ANTH 3002 - Sex, Evolution, and Behavior: Examining Human Evolutionary Biology (4.0 cr)

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•ANTH 4329 - Primate Ecology and Social Behavior (3.0 cr)
or EEB 4329 - Primate Ecology and Social Behavior (3.0 cr)
•EEB 4609W - Ecosystem Ecology [ENV, WI] (3.0 cr)
or EEB 5609 - Ecosystem Ecology (3.0 cr)
•PMB 3212 - Fungi - A Kingdom of Their Own (3.0 cr)
or PMB 5212 - Fungi - A Kingdom of Their Own (3.0 cr)
•Grand Challenge Curriculum Courses
Take 0 - 1 course(s) from the following:
•GCC 3xxx
•GCC 5xxx

Upper-Division Writing Intensive within the Major
Students are required to take one upper-division writing intensive course within the major. If that requirement has not been satisfied within the core major requirements, students must choose one course from the following list. Some of these courses may also fulfill other major requirements.
Take 0 - 1 course(s) from the following:
•BIOC 4025W - Laboratory in Biochemistry [WI] (2.0 cr)
•BIOC 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•BIOC 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•BIOL 4321W - Deconstructing Research: Writing about Biological Research for Non-scientists [WI] (2.0 cr)
•BIOL 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•BIOL 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•COP 4793W - Writing Intensive Directed Studies [WI] (1.0 - 7.0 cr)
•COP 4794W - Writing Intensive Directed Research [WI] (1.0 - 7.0 cr)
•EEB 3408W - Ecology [WI] (4.0 cr)
•EEB 3412W - Introduction to Animal Behavior, Writing Intensive [WI] (4.0 cr)
•EEB 3811W - Animal Behavior in the Field [WI] (4.0 cr)
•EEB 3851W - Health and Biodiversity [ENV, WI] (3.0 cr)
•EEB 4330W - Animal Communication [WI] (3.0 cr)
•EEB 4609W - Ecosystem Ecology [ENV, WI] (3.0 cr)
•EEB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•EEB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•GCD 4005W - Cell Biology-Writing Intensive [WI] (4.0 cr)
•GCD 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•GCD 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•MICB 4161W - Eukaryotic Microbiology [WI] (3.0 cr)
•MICB 4225W - Advanced Laboratory: Microbial Genetics [WI] (3.0 cr)
•MICB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•MICB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•NSCI 3001W - Neuroscience and Society [CIV, WI] (4.0 cr)
•NSCI 3102W - Neurobiology II: Perception and Behavior [WI] (3.0 cr)
•NSCI 3505W - Mind and Brain [WI] (4.0 cr)
•NSCI 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 6.0 cr)
•NSCI 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•PMB 3005W - Plant Function Laboratory [WI] (2.0 cr)
•PMB 3007W - Plant, Algal, and Fungal Diversity and Adaptation [WI] (4.0 cr)
•PMB 4516W - Plant Cell Biology: Writing Intensive [WI] (3.0 cr)
•PMB 4793W - Directed Studies: Writing Intensive [WI] (1.0 - 7.0 cr)
•PMB 4794W - Directed Research: Writing Intensive [WI] (3.0 - 5.0 cr)
•GCD 4144W - Human Genetics - Writing Intensive [WI] (4.0 cr)

Program Sub-plans
A sub-plan is not required for this program.

Integrated BS/MPH-Environmental Health
The College of Biological Sciences (CBS) and the School of Public Health (SPH) offer an early-admission opportunity for eligible CBS students interested in pursuing the Environmental Health MPH degree.

The MPH program in the Division of Environmental Health Sciences emphasizes the scientific, technological, policy, and management skills required to address environmental health concerns. These concerns include investigating health hazards in our environment, protecting worker health, and establishing the basis for public health policy. The Division of Environmental Health is committed to graduating professionals with interdisciplinary training, which includes practicing innovative problem solving, and gaining experience with a diversity of approaches and applications.

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To be eligible for this program, applicants must be admitted undergraduate students in the College of Biological Sciences, have completed at least 60+ credits, and have a GPA of a least 3.25.

Students admitted to the Integrated BS/MPH-Environmental Health program take 12 MPH credits during their senior year, and complete the MPH by taking remaining credits as a full-time graduate student in the summer and academic year after completing their undergraduate degree.

Graduate courses cannot be applied toward both BS and MPH credit and degree requirements. Admitted students must maintain timely degree progress to ensure that the BS degree is awarded no later than the end of the senior year.

The application deadline for the Integrated BS/MPH-Environmental Health opportunity is the spring of the applicant's junior year. Interested students should consult with their CBS academic advisor or School of Public Health for application instructions.

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