Fall 2023
Registration

[Check SPIRE for your enrollment start date. It will be in one of the date ranges listed below.]

Seniors *(87 credits & above)*	**Apr 19-20**
Juniors *(57-86 credits)*	**Apr 24-25**
Sophomores *(27-56 credits)*	**Apr 27-28**
Freshmen *(26 credits & below)*	**May 1**

Note: Enrollment start times and eligibility to register for courses that are restricted by level are determined by a student's potential credit total, which includes the credits he or she is enrolled in currently (i.e., courses). The Biology Department does not assign a specific advisor to our majors. Biology majors do not need advisor permission to enroll. Advising is NOT mandatory but we are happy to meet with you and help with your course selection.

UNDERGRADUATE ADVISING OFFICE:
PLEASE SCHEDULE ADVISING APPOINTMENTS EARLY
https://umass.campus.eab.com/
Morrill Science Center III, Room 216
413.545.2287

Biology Peer Advising Spring 2023:
This schedule is most weeks. Please check daily for updates.
Monday 9:00-4:30
Tuesday 9:00-3:30, 4:00-5:00
Wednesday 9:00-4:30
Thursday 9:00-5:00
Friday 9:00-11:00, 2:30-4:00

To schedule an appointment with a peer advisor:
Use this link —> https://umass.campus.eab.com/ You will need to log in with your NET ID and password and then click on the blue make appointment button in the upper right corner of the screen. Select you would like to make an appointment with a biology peer advisor.

To drop in with a peer advisor:
You can access the Peer Advising meeting in Zoom using this link: https://umassamherst. zoom.us/s/96882561838. Peers will only be available through this link at the times listed above.

REGISTRATION TIPS

COURSE OVERRIDE PERMISSION FORMS: If you would like to enroll in a class that is full, monitor the course on SPIRE to see if someone drops. Some instructors may accept "extra" students. If an instructor agrees to an override, have him or her sign a course override form. Send the completed form, including a signature or other indication of approval from the faculty supervisor to Sue Clevenger (clevenge@umass.edu).
To help us efficiently process your override, please drop all conflicting courses and apply for credit overload if the course you would like to add will put you over 19 credits.

SPECIAL NOTE: SPIRE WILL STOP PROMOTING STUDENTS FROM WAITLISTS TO COURSE OPENINGS AFTER THE FIRST DAY OF CLASSES (Tuesday, September 5, 2023).

Deans of the College of Natural Sciences

Morrill II Room 220
413.545.1969

Elizabeth Connor, Associate Dean
Cathy Eden, Director Pre-Med/Pre-Dent/Pre-Health

You need a dean's approval for:
Credit Overload: Apply online Credit Overload Petition
Withdrawal from a course after the deadline: Apply online Late Withdrawal Petition

CHANGING YOUR MAJOR

To change your major, contact a representative in the undergraduate department of the NEW major. They will change your record in SPIRE and/or inform you of any additional steps in the process.

TRANSFER STUDENTS

Transfer credit for BIOL 151/152/153

Students who have transfer credit from another school for these Introductory Biology courses may not be able to add courses for which the intro courses are prerequisites (for example: Biology 285, 287, 311). If you encounter this problem, please call or stop by the undergraduate office (413-545-2287, 216 MOR3). We will verify that you have satisfied the prerequisites and then manually add the course you desire to your class schedule, if the course is not full.

Transcript/Transfer Credit

If you have completed courses at another University but they do not appear on your UMass transcript, please have the school at which you took the courses send a transcript to the Records Office, 207 Whitmore Administration Building.

PARTICIPATE IN A RESEARCH LAB FOR INDEPENDENT STUDY CREDIT OR JUST FOR THE EXPERIENCE.

It's up to you to first make arrangements with a faculty member who will sponsor your project. Check out our Biology faculty and their research interests at http://www.bio.umass.edu/biology/faculty/faculty-listing. When you're ready to enroll in independent study credits, fill out the Independent Study Form (for Biology majors and students working with a Biology faculty member only). Send the completed form, including a signature or other indication of approval from the faculty supervisor to Sue Clevenger (clevenge@umass.edu). If you're a sophomore sign up for BIOL 296; if you're a junior, BIOL 396; seniors sign up for BIOL 496. You may sign up for the same Independent Study number during multiple semesters. It is always a good idea to check your student enrollment list (classes you are enrolled in) prior to the end of the add/drop period to make sure it is correct. Also, if you need credit overload approval you should apply for it promptly (Credit Overload Petition) and notify the staff in the Undergraduate Advising Office so they are aware of it and will place a note on your course permission form. They cannot add you until your Academic Dean has approved your credit overload.

The Biology Undergraduate Apprenticeship (BUA) advertises research positions for the fall semester beginning Saturday, April 2 at 12:01PM through Wednesday, April 13 at 11:59PM. The BUA website allows Biology undergraduates to see and apply to research opportunities in faculty laboratories focusing on biological research. Undergraduates at any stage of their training and interest can apply. Visit BUA at https://www.bio.umass.edu/bura/. BUA positions for the upcoming semester will be posted at the beginning of the semester.

NOTE: If you're doing research for an Honor's thesis, you should contact the Honor's Program to register. It is also important that you then notify the staff in the Biology Undergraduate Advising office so they will know which faculty member should deliver your grade.

Integrative Experience - Required for Biology majors

1. Take Biology 494 LI, Life After Biology (1-cr seminar, offered every semester)

2. Make sure that your upper-level elective courses include at least one of the following courses:

    Biology 372 Introductory Neurobiology
    Biology 383H Gene and Genome Analysis
    Biology 421 Plant Ecology
    Biology 422 Field Ecology: An Experimental Approach
    Biology 477H Bioimaging
    Biology 486H Tackling Biomedical Problems with Molecular Biology
    Biology 487H Tropical Field Biology
    Biology 514 Population Genetics
    Biology 523 Histology
    Biology 550 Animal Behavior
    Biology 551 Animal Communication
    Biology 572 Neurobiology
    Biology 582 DNA to Diversity

Fall 2023 BIOLOGY COURSES

Subject	Course	No. Section	Course Name	Instructor	Day	Time
BIOL	109	LEC 1	Evolution Explained	Porter	MW	2:30-3:45
BIOL	151	LEC 1	Intro Biology	Phillis	MWF	12:20
BIOL	151	LEC 2	Intro Biology	Zehnder	MWF	9:05
BIOL	151	LEC 3	Intro Biology	Huyler	MWF	8:00
BIOL	151	LEC 4	Intro Biology	Rounds	MW	2:30-3:45
BIOL	151	LEC 5	Intro Biology	Moscarella	TUTH	2:30-3:45
BIOL	151	LEC 6	Intro Biology (BioPioneers)	Phillis	MWF	11:15
BIOL	152	LEC 1	Intro Biology II	Rounds	MWF	12:20
BIOL	153	LAB	Intro Biology Lab	Rocheleau	various	
BIOL	161H	LEC 1	Quantitative Biology of the Cell	Francis, Rounds	TUTH	10:00-11:15
BIOL	280	LEC 1	Evolution	Byers	MWF	12:20
BIOL	280	LEC 2	Evolution	Healey	MW	2:30-3:45
BIOL	284	LAB 1	Genetics Lab	Loomis	TU	1:00-5:00
BIOL	284	LAB 2	Genetics Lab	Loomis	TH	1:00-5:00
BIOL	284	LAB 3	Genetics Lab	Laney	M	1:25-5:25
BIOL	284	LAB 4	Genetics Lab	Laney	W	1:25-5:25
BIOL	285	LEC 1	Cell & Molecular Biology	Francis	MWF	11:15
BIOL	287	LEC1	Intro Ecology	Healey	TUTH	1:00-2:15
BIOL	288	LEC 1	Intro Physiology	Lonthair	MW	2:30-3:45
BIOL	288	LEC 2	Intro Physiology	Stager	TUTH	4:00-5:15
BIOL	282	LAB 1	Phage Bioinformatics	Rocheleau, Chien	MW	2:30-3:45
BIOL	311	LEC 1	Genetics	Walker	MWF	10:10
BIOL	311	LEC 2	Genetics	Loomis	MWF	12:20
BIOL	312	LEC 1	Writing in Biology	Brewer	F	1:25-3:45
BIOL	312	LEC 2	Writing in Biology	Zehnder	MW	2:30-3:45
BIOL	312	LEC 3	Writing in Biology	TBD	TUTH	8:30-9:45
BIOL	312	LEC 4	Writing in Biology	Houlihan	MW	12:30-1:25
BIOL	312	LEC 5	Writing in Biology	Spracklen	TUTH	11:30-12:45
BIOL	312	LEC 6	Writing in Biology	Lonthair	TUTH	1:00-2:15
BIOL	312	LEC 7	Writing in Biology	Okusu	TUTH	10:00-11:15
BIOL	335	LEC 1	Topics in Plant Biology	Caicedo, Facette	TUTH	11:30-12:45
BIOL	372	LEC 1	Intro Neurobiology	Jensen	TUTH	8:30-9:45
BIOL	372	LEC 1	Intro Neurobiology	Padilla	TUTH	10:00-11:15
BIOL	422	LEC 1	Field Ecology: An Experimental Approach	Adler	TUTH	1:00-2:15
BIOL	424	LEC 1	Marine Biology	Okusu	MW	2:30-3:45
BIOL	426	LEC 1	New England Flora	Seidler	MW	12:20
BIOL	477H	LAB 1	Bioimaging	Stephens	TUTH	1:00-4:00
BIOL	494LI	LEC 1	Life After Biology	Gerson	W	4:00-4:50
BIOL	489	LEC 1	Animal Movement	Gerson, Irschick	MW	2:30-3:45
BIOL	479	LEC 1	Genomics and Data Science	Babbitt	TU	2:30-5:30
BIOL	478	LEC 1	Human Genome Analysis	Blanchard	W	9:05-12:05
BIOL	501	LEC 1	Human Microbiome in Health and Disease	Riley	TUTH	1:00-2:15
BIOL	521	LEC 1	Comparative Anatomy	Moscarella	TUTH	11:30-12:45
BIOL	550	LEC 1	Animal Behavior	Podos	TUTH	10:00-11:15
BIOL	550	LEC 2	Animal Behavior	Jakob	MW	2:30-3:45
BIOL	551	LEC 1	Animal Communication	Houlihan	TUTH	11:30-12:45
BIOL	564	LEC 1	Human Physiology	Woerman	TUTH	8:30-9:45
BIOL	572	LEC 1	Advanced Neurobiology	Downes	TUTH	1:00-2:15
BIOL	580	LEC 1	Developmental Biology	Spracklen	TUTH	2:30-3:45
BIOL	582	LEC 1	DNA to Diversity	Albertson	TUTH	2:30-3:45
BIOL	583	LEC 1	Advanced Genetics	Laney	TUTH	10:00-11:15

Biology Course Descriptions
Fall 2023

109—Evolution Explained
(BS) Porter, Morrill1 N440
This course examines evolutionary biology with an emphasis on the scientific basis of evolution, and attention to the implications of evolutionary thought in contemporary society. Not intended for life-science majors. Not for Biology major credit.
Prerequisites: None

151—Introductory Biology (4 cr.)
(BS) Huyler, ISB 427T; Moscarella Morrill2 350; Phillis, Morrill3 404; or Rounds Morrill2 354; Zehnder, Morrill 2 348C
First semester of a full year course for majors in the life sciences. Introduction to the biochemical basis of living systems, cell biology, mitosis and meiosis, principles of genetics, developmental biology. Includes lecture and discussion sections. Required for biology majors. (Gen. Ed. BS)

152—Introductory Biology (3 cr.)
(BS) Rounds, Morrill2 354
Lecture. Second semester of a full semester course for science majors. Lecture: Topics in organismal and evolutionary biology: evolution, survey organisms representing the diversity of life; plant and animal structure and physiology, ecology.

153—Introductory Biology Lab (2 cr.)
Rocheleau, Morrill3 316
This course is a 2-credit laboratory experience that allows students to apply the biological concepts covered in Biology 151 and 152 Introductory Biology in laboratory and field settings. Students will develop and practice scientific research skills while exploring the areas of genetics, cell and molecular biology, evolution, and ecology. To enroll, students must be co enrolled in Biology 152 (Introductory Biology II) or have completed the 2 semester Introductory Biology Sequence (Biol 151 and 152).

161H—Quantitative Biology of the Cell (4 cr.)
Francis, Morrill2 360; Rounds, Morrill2 354
An introduction to the workings of the cell, focusing on themes of cellular structure, dynamics and energetics. This course is intended for students interested in a broad interdisciplinary approach to the biological sciences: frequent connections to chemistry, physics and mathematics will be made as the cell, it's inner workings and malfunctions, are explored.
Prerequisite: Open to students in BIOTAP only

280—Evolution: Diversity of Life Through Time (3 cr.)
Byers, Morrill3 216A; Healey, Morrill2 356A
We will investigate the process of biological evolution and the evolutionary history of life on Earth. Topics to be covered include natural selection, speciation (the formation of new species), and other causes of evolutionary change; the methods that evolutionary biologists use to investigate evolutionary processes and history; and an overview of life's history, focusing on major evolutionary innovations and transitions.
Prerequisites: Biology 190H/197FH or Biology 151, 152 & 153 with a grade of 'C' or better.

284—Genetics Lab
Loomis, ISB 241D; Laney, Morrill2 432
Various classical and molecular genetic techniques using prokaryotic and eukaryotic systems. Laboratory projects include genetic mapping via recombination and P element-mediated mutagenesis in Drosophila, plasmid-mediated transformation of bacteria, yeast 2-hybrid assays for protein/protein interactions, and detection of human DNA polymorphisms. Also, bioinformatics tools to perform DNA and protein sequence similarity searches and characterize the organization of specific genes. **Prerequisites**: Biology 161H/162H or Biology 151, 152 & 153 with a grade of 'C' or better; and BIOL 311 with a grade of 'C' or better

285—Cell & Molecular Biology (3 cr.)
Francis, Morrill2 348A
Course designed for sophomores in Biology, Biochemistry, or Microbiology. Building upon concepts learned in Biology 151/152, consideration is given to structure and function. The course is equally divided between aspects of molecular and cellular biology.
Prerequisites: Biology 161H/162H or Biology 151, 152 & 153 with a grade of 'C' or better

287—Introductory Ecology (3 cr.)
Healey, Morrill2 356A
The scope of ecology; how organisms cope with environmental challenges; population dynamics; species interactions of competition, predation, and mutualism; community ecology; biodiversity; biogeochemical cycles; selected topics in evolutionary and behavioral ecology. Basic concepts related to practical applications in harvesting, biological control, conservation, pollution, and global change.

Prerequisites: Biology 161H/162H or Biology 151, 152 & 153 with a grade of 'C' or better

288—Introductory Physiology (3 cr.)
Lonthair, Morrill3 348B; Stager, Morrill2, 427
The physiology of humans and other vertebrates on a system-by-system basis (e.g., circulatory, respiratory, digestive, etc.). Emphasis on understanding fundamental physiological concepts. Concentrates primarily on human physiology, but examples from other vertebrate animals used to illustrate some physiological phenomena.
Prerequisites: Biology 161H/162H or Biology 151, 152 & 153 with a grade of 'C' or better

282—Phage Bioinformatics (3 cr.)
Rocheleau**,** Morrill3 316**;** Chien, LSL Rm N325
This research-focused course uses bacteriophage genomics to introduce biology as an experimental science. Students learn computational biological techniques through annotation and characterization of novel viral genomes. Students will be introduced to concepts in bioinformatics, microbiology, evolution, and molecular biology through hands-on experiments driven by results obtained during class.

311—General Genetics (3 cr.)
Loomis, ISB 241D; Walker, Morrill4S 374C
This course discusses the principles of genetics with application to the study of biological function at the level of molecules, cells, and multicellular organisms, including humans. The topics include structure and function of genes, chromosomes and genomes, biological variation resulting from recombination, mutation, and selection, use of genetic methods to analyze protein function, gene regulation and inherited disease.
Prerequisites: C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162H

Biology 312—Writing in Biology (3 cr.)
Satisfies Junior Year Writing requirement for Biology majors

Section 1 Brewer, Morrill 3 311A
See SPIRE for description
Section 2 Zehnder, Morrill2 348C
See SPIRE for description
Section 3 TBD
See SPIRE for description
Section 4 Houlihan, Morrill2 352
Students write and revise short papers on subjects likely to be encountered by biologists. Class discussion of papers.
Section 5 Spracklen, Morrill 2 348B
See SPIRE for description
Section 6 Lonthair, Morrill3 348B
See SPIRE for description
Section 7 Okusu
See SPIRE for description

Prerequisites: 3 biological science courses, for declared Biology Majors ONLY

335—Topics in Plant Biology (3 cr.)
Caicedo, LSL N425; Facette, Morrill4S 375D
We have two goals in this course. The first, and most important, is to introduce Undergraduate Biology students to some of the many fascinating aspects of Plant Biology, especially as these differ from animal biology. For instance, did you know that plants are moving (on a large scale) all the time? It's the truth, but in a very different time scale than we animals use. How do plants do that without the benefit of muscles and a skeleton? Have you ever thought about how, in the absence of a pumping heart, plants' circulatory systems work? After all, the water at the top of a tree got there from roots in the ground, but no pump was involved. Plants don't have an immune system, and yet, they 'stand and fight' - literally rooted to the spot - taking on all types of pathogens, as well as insects and otherpredators. What strategies do plants use to overcome these attacks? Have you ever wondered about how biotechnology is used in agriculture? We have all heard news stories about GMO's (genetically modified organisms). What are these and what makes them useful or dangerous? These are the types of topics we will be covering in this course. The second goal for this course is to provide a convenient way for UMass Biology majors to accomplish their plant biology course requirement.

372—Intro Neurobiology (3 cr)
Jensen, Morrill3 414A; Padilla, LSL N227
This course functions as an introductory survey to neurobiology with a focus on cellular neuroscience. It provides a knowledge base for future advanced neuroscience courses and a stand-alone course for Biology majors. Topics within neuronal anatomy and physiology will be covered, including membrane potentials and neural transmission, sensory and motor systems, neuromodulatory and homeostatic systems. This course is not-for-credit for those who have previously taken Psych 330 or Biol 572.

422—Field Ecology: An Experimental Approach (4 cr.)
Adler, Fernald 102D
This course provides an introduction to methods in field ecology, with an emphasis on rigorous experimental design, hypothesis testing, data collection, introductory data analysis, and presenting results. The ability to pose clear questions, state hypotheses, and design appropriate experiments to test these hypotheses is of fundamental importance in all research disciplines; this course takes advantages of challenges in field ecology to address these essential topics. We will use formal lectures, interactive discussions, and hands-on learning in the field and computer lab, including field data collected during the laboratory time, as examples to learn the fundamental concepts that are essential for designing effective experiments. This course will provide students with the skills to designand conduct experiments to address basic and applied ecological questions.

424—Marine Biology (4 cr.)
Okusu, Morrill 2 140
This course introduces life in the sea from ecological and evolutionary perspectives. Specific topics will include primary and secondary production, interrelations of marine organisms and their environment (e.g. rocky intertidal, estuaries, interstitial communities, coral reefs, deep-sea communities), adaptations of marine organisms, human impacts on marine life, biodiversity, conservation, and aquaculture. Students will also learn about recent advances in marine research by reading primary literature on specific topics including metazoan body-plan evolution, development, paleontology and phylogeny. Grades C or better in Biology 151, 152, 153, and either Biology 280 or 287.

426—New England Flora (3 cr.)
Seidler, Morrill1N 239B
Learn the vascular plants of the region in their natural habitats through field trips and in the laboratory with the use of botanical keys and manuals. Field experience will include some collecting and pressing of specimens. The class also visits the herbarium and greenhouses. Recognition of certain plant families and familiarity with terminology will be gained. **Prerequisite:** Introductory biology or consent of instructor

477H—BioImaging (4 cr.)
Stephens, Morrill4 454
Bioimaging is a project-based laboratory course that focuses on the use of microscopy in the life sciences, ranging from the principles of optics to the use of specialized microscopic techniques to investigate the structure and behavior of various types of cells. Using research-quality fluorescence microscopes purchased on the HHMI grant, students learn to use both phase and fluorescence microscopy, and to take digital stills and movies with both. They observe the movements of living cells in response to various substrates or drugs, and they learn to fix and stain cells to see greater internal detail, using quantification techniques to measure the size or concentration of various cellular components. Then they apply these techniques to the independent investigation of a particular problem regarding cell division, locomotion, or growth.

494LI—Life After Biology (1 cr.)
Gerson, Morrill3 318A
This 1-credit course fulfills one component of the General Education Integrative Experience requirement for Biology majors. The course is designed to help students appreciate what their academic training has been, and where it is leading them professionally. Students will learn about career options for life scientists and develop strategies and skills to position themselves to be successful. In order to satisfy the Integrative Experience requirement, BA-Biol and BS-Biol majors must also take one of the approved 3- or 4-credit Biology courses listed on their Academic Requirements Report.

489—Animal Movement (3 cr.)
Irschick, Morrill3 205C; Gerson, Morrill3 318A
In this course we will investigate the integrative biology of animal movement, with in depth investigations into migration. We will begin by characterizing animal movements and locomotory styles among various taxa of animals and we will investigate the origins, underlying physiology, energetics, biomechanics, and ecology of complex animal movements.

479—Genomics and Data Science (3 cr.)
Babbitt, Morrill4S 362
This course provides an introduction to genomics, bioinformatics and data sciences skills. Computer-based lab sessions will provide hands-on training in data science skills (Unix command line, Python, R, reproducible research, and cluster computing) and we will use them to learn bioinformatic methods related to gene expression, detecting variation, genome visualization, and critical statistical methods to understand large-scale datasets. The final project will be data analysis of the student's choice. Prerequisites: Biology 151 or 161H with a grade of 'C' or better AND Biology 152 or 162H with a grade of 'C' or better.

478—Human Genome Analysis (3 cr.)
Blanchard, Morrill 3 409A
Human Genome Analysis covers current topics in genetics and the social, ethical and legal issues surrounding genetic sequencing technology. Topics include genome structure and evolution, genetics of disease, personal genomics, human microbiomes and epidemiology. Students will have the opportunity to submit their DNA for genome-wide SNP and gut microbiome determination. Practical skills for analyzing genetic and genomic data are taught through weekly bioinformatic sessions in the R statistical programming language.

501—Human Microbiome in Health and Disease (3 cr.)
Riley,Morrill3 304A
Research into the microbiome?the indigenous microbial communities and the host environment that they inhabit?has changed our views of the roles played by microbes in human health and disease. Perhaps the most radical change is the realization that most of the microbes that inhabit our body supply crucial ecosystem services that benefit the entire host-microbe system. These services include the production of important resources, bioconversion of nutrients, and protection against pathogenic microbes. Disease can result from a loss of these beneficial functions or the introduction of maladaptive functions by invading microbes. This course will provide an introduction to the microbiome, identify the essential players, explore how they are acquired and discuss their roles in human health. We will also employ a case study approach to investigate examples of our growing knowledge of how disruptions in the microbiome can impact numerous aspects of human health, ranging from autoimmune diseases and obesity to Parkinson?s disease and depression.
Prerequisites: BIOLOGY 151, 152, and 153 with C or higher in all.

521—Comparative Vertebrate Anatomy (4 cr.)
Moscarella, Morrill2 350
With lab. Detailed approach to the structure and evolutionary relationships of vertebrates. Evolutionary and functional significance of structures in different groups. Lab involves evolutionary trends and specializations, experience in dissection. Prerequisite: BIOLOGY 288 with a grade of "C" or better.

550—Animal Behavior (4 cr.)
Jakob, Morrill3 401; Podos, Morrill 2 332A
Our first goal in this course will be to examine the mechanisms that underlie the expression of behavior. For example, how do predators locate prey, how do animals avoid becoming prey, and how do animals navigate through their world? To help answer these questions we will apply neurobiological, hormonal, genetic, and developmental perspectives. Our next goal in the course will be to examine the evolutionary bases of behavior, asking for example why animals move, forage, hide, communicate, and socialize as they do. To address these questions, we make use of optimality theory and other behavioral ecological perspectives. Other topics in the course will include sexual selection, human behavior, and the role of behavior in establishing biodiversity. When taken with Biology 494LI, this course satisfies the Integrative Experience requirement for BA-Biol and BS-Biol students. **Prerequisite:** an introductory biology or psychology course

551—Animal Communication (3 cr.)
Houlihan, Morrill2 352
This course will explore animal communication from several biological perspectives. We will explore how animals use different modalities of communication (sound, smell, electricity, etc.) and how these modes of sending and receiving information are limited by environmental constraints and their functions. We will look at the physiological and anatomical aspects of signal production and perception. The class will discuss the different types of messages encoded in signals and how they evolved. We will explore the evolution of sexually selected forms of communication (antlers, bird song, etc.) and the theories that attempt to explain their function and evolution. The lectures/discussions will draw on examples from a diverse selection of animals (insects, fish, birds, and mammals). Students will also work on projects where they will learn how to analyze and interpret different forms of vocal and visual communication.

564—Human Physiology (3 cr.)
Woerman, LSL N263
Mechanisms underlying organ system function in vertebrates; nervous, endocrine, cardiovascular, respiratory, muscular, digestive, excretory, reproductive systems.
Prerequisites: BIOL 288

572—Advanced Neurobiology (3 cr.)
Downes, Morrill4 N210
This course explores the biology of nerve cells and cellular interaction in nervous systems. Lectures integrate structural, functional, molecular, and cellular approaches. Topics include membrane potentials and neuronal signaling, nervous system structure, sensory systems, control of movement, motivated behaviors, emotion, mental illness, and memory. Format includes lectures and in-class discussions. 4 exams, 2 papers, and participation in an online forum. Prerequisites: Biology 285 or Biochemistry 275, or both Psychology 330 and Biology 151.
Prerequisites: C or better in BIOLOGY/BIOCHEM/ANIMLSCI 285 (or BIOCHEM 275) and PSYCH 330 (or BIOLOGY 372)

580—Developmental Biology (3 cr.)
Spracklen, Morrill2 348B
Analysis of organismal development, with special attention to cell-cell interactions, cells fate determination, gene regulation, signal transduction, pattern formation and terminal differentiation. The emphasis will be on molecular approaches to these problems..
Prerequisites: Biology 285 or 523; or both Psychology 330 and Biology 151

582—DNA to Diversity (3 cr.)
Albertson, Morrill2 336
How do complex morphologies develop from a single-cell embryo? What makes the human hand different from the horse's hoof, the bat's wing, or the flipper of a whale? These and related questions will be addressed as we explore the genetic and developmental basis of evolutionary change.
Prerequisite: BIOL 280 (C or better)

583—Advanced Genetics (3 cr.)
Laney, Morrill 2 432
This course covers current topics and advanced concepts and techniques in genetics and their use in answering fundamental questions in biology. Theoretical background and experimental approaches will be emphasized. Topics will include, but are not limited to, gene and genome structure and function, tools and approaches of genetic analysis, recombination and mapping, and developmental and quantitative genetics.
Prerequisites: BIOL 311 (C or better)

Biology Faculty and Their Research Interests

http://www.bio.umass.edu/biology

Click on Faculty

Lynn Adler, Professor
Ecology and Evolution of Insect-Plant Interactions
lsadler@bio.umass.edu Fernald 102D

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Courtney Babbitt, Assistant Professor
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Tobias I. Baskin, Professor
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and Evolution, Genomics, Bioinformatics
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Science Education/Instructional Technology
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Bruce E. Byers, Associate Professor
Songbird Vocalizations
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Karine Fenelon, Assistant Professor
Synaptic Transmission and Neural Circuits
Underlying Sensory Information Filtering
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Quantitative Evolutionary Cell Biology
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Alexander Gerson, Assistant Professor
Integrative Eco-physiology – Environmental Physiology of Birds
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Samuel P. Hazen, Associate Professor
Regulatory Networks & Natural Variation in
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Elizabeth Jakob, Professor/Assoc Dean of the Grad School
Behavioral Ecologist
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Abigail Jensen, Associate Professor
Molecular and Cellular Mechanisms of Vertebrate
Retinal Development and Retinal Disease
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