Spring 2024

Course Registration

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

Seniors (87 credits & above)	**Nov 6-7 (M,T)**
Juniors (57-86 credits)	**Nov 8-9 (W, TH)**
Sophomores (27-56 credits)	**Nov 13-14 (M, T)**
Freshmen (26 credits & below)	**Nov 16-17 (TH,F)**

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. Fall 2023 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 Fall 2023
Monday –9 AM-12:00 PM, 12:30 PM-5:00 PM
Tuesday – 10:00 AM-2:00 PM, 3:00 PM-5:00 PM
Wednesday – 9:00 AM-4:00 PM
Thursday – 10:00 AM-12:30 PM, 2:30 PM-3:30 PM, 4:00 PM-5:00 PM
Friday – 10:00 AM-4:00 PM

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 that 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://umass-amherst.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 (Thursday, February 1, 2024).

Dean's Office, College of Natural Sciences

Morrill II Room 220
413.545.1969

Elizabeth Connor, Associate Dean
Brenda Barlow, Assistant Dean
Leo Hwang, Assistant Dean
Cathy Eden, Director Pre-Med/Pre-Dent/Pre-Health

You need a dean's approval for:
Credit Overload: Apply online https://secure.cns.umass.edu/webforms/credit-overload-petition
Withdrawal from a course after mid-semester: Apply online
https://secure.cns.umass.edu/webforms/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 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 Morrill). 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.

TRANSCRIPTS/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 to get credit overload approval you should apply

promptly (http://www.cns.umass.edu) 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 beginning on the first day of classes each semester. 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. BUA has matched over 100 undergraduates and research projects since fall 2010! Visit BUA at https://bua.bio.umass.edu/. BUA positions for the upcoming semester will be posted at the beginning of the semester.

NOTE: If you are 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 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 Advanced Neurobiology
    Biology 582 DNA to Diversity

Spring 2024 BIOLOGY COURSES

Subject	Course #	Section	Course Name	Instructor	Day	Time
BIOL	105	LEC 1	Biology of Social Issues	Riley	MWF	1:25
BIOL	105H	LEC 1	Biology of Social Issues	TBA	TuTh	10:00-11:15
BIOL	110	LEC 1	Intro Biology for Science Majors	Zehnder	MW	2:30-3:45
BIOL	151	LEC 1	Intro Biology 1	Phillis	TuTh	2:30-3:45
BIOL	151	LEC 2	Intro Biology 1	Francis	MWF	1:25
BIOL	152	LEC 1	Intro Biology 2	Rounds	MW	2:30-3:45
BIOL	152	LEC 2	Intro Biology 2	Houlihan	TuTh	10:00-11:15
BIOL	152	LEC 3	Intro Biology 2	Healey	TuTh	1:00-2:15
BIOL	152	LEC 4	Intro Biology 2	Zehnder	MWF	9:05
BIOL	152	LEC 5	Intro Biology 2 (BioPioneers RAP)	Zehnder	MWF	11:15
BIOL	153	LAB1-36	Intro Biology Lab	Rocheleau	various	various
BIOL	162H	LEC 1	Quantitative Systems Biology	Riley	TuTh	1:00-2:15
BIOL	280	LEC 1	Evolution	Porter	MWF	12:20
BIOL	280	LEC 2	Evolution	Albertson	MWF	11:15
BIOL	284	LAB 1	Genetics Lab	Chilufya	Tu	1:00-5:00
BIOL	284	LAB 2	Genetics Lab	Chilufya	Th	1:00-5:00
BIOL	285	LEC 1	Cell & Molecular Biology	Rounds	TuTh	10:00-11:15
BIOL	287	LEC 1	Intro Ecology	Seidler	MWF	10:10
BIOL	288	LEC 2	Intro Physiology	Lonthair	TuTh	2:30-3:45
BIOL	311	LEC 1	General Genetics	Chilufya	MWF	9:05
BIOL	311	LEC 2	General Genetics	Moscarella	TuTh	10:00-11:15
BIOL	312	LEC 1	Writing in Biology	Spracklen	TuTh	11:30-12:45
BIOL	312	LEC 2	Writing in Biology	Lonthair	MW	2:30-3:45
BIOL	312	LEC 3	Writing in Biology	TBD	TuTh	4:00-5:15
BIOL	312	LEC 4	Writing in Biology	Brewer	F	1:25-3:45
BIOL	312	LEC 5	Writing in Biology	TBD	TuTh	10:00-11:15
BIOL	312	LEC 6	Writing in Biology	Okusu	TuTh	11:30-12:45
BIOL	312H	LEC 1	Writing in Biology	TBD	TuTh	10:00-11:15
BIOL	372	LEC 1	Intro Neurobiology	Vazey	MWF	1:25
BIOL	372	LEC 1	Intro Neurobiology	Jensen	TuTh	8:30-9:45
BIOL	401	LEC 1	Great Papers in Biology	Stephens	TuTh	2:30-3:45
BIOL	424	LEC 1	Marine Biology	Okusu	TuTh	8:30-9:45
BIOL	427	LEC 1	How to Make a Perfect Plant	Bartlett	MW	1:25-2:15
BIOL	475	LEC 1	Plant Cell Biology	Facette	MWF	9:05
BIOL	476	LEC 1	Evol Genomics & Bioinformatics	Blanchard	W	9:05-12:05
BIOL	484	LEC 1	Cancer Genetics	Phillis	M	12:20
BIOL	494LI	LEC 1	Life After Biol: Biol Integrated Exp	Gerson	W	4:00-4:50
BIOL	514	LEC 1	Population Genetics	Caicedo	TuTh	1:00-2:15
BIOL	523	LEC 1	Histology	Spracklen	TuTh	8:30-9:45
BIOL	544	LEC 1	Ornithology	Byers	TuTh	11:30-12:45
BIOL	548	LEC 1	Mammalogy	Moscarella	TuTh	1:00-2:15
BIOL	550	LEC 1	Animal Behavior	Houlihan	TuTh	11:30-12:45
BIOL	552	LEC 1	Neural Basis of Animal Behavior	Katz	TuTh	10:00-11:15
BIOL	559	LEC 1	Cell Biology II	Fritz-Laylin	TuTh	11:30-12:45
BIOL	564	LEC 1	Human Physiology	Padilla	TuTh	10:00-11:15
BIOL	567	LEC 1	Comparative Physiology	Irschick	TuTh	10:00-11:15
BIOL	579	LEC 1	Developmental Neurobiology	Pallas	TuTh	2:30-3:45
BIOL	583	LEC 1	Advanced Genetics	Hazen	TuTh	1:00-2:15
BIOL	586	LEC 1	Cellular Biology of Disease	Francis	MW	2:30-3:45

Biology Course Descriptions
Spring 2024

105/105H—Biology of Social Issues (4 cr.)
105 - (BS) Riley, Morrill3, 304A
105H - (BS) TBA
For non-science majors; not for Biology major credit. Designed to provide non-science majors with the basic knowledge that an informed citizen requires to develop thoughtful positions on sometimes controversial questions related to medical ethics, environmental degradation, cloning, biotechnology, STDs and education.

110—Introductory Biology for Science Majors (4 cr.)
(BS) Zehnder, Morrill2 348C
This is a course for non-biology majors. In this course, we will explore biological principles at all levels of organization, from molecules and cells and to populations and the biosphere. Importantly, we will examine how biological topics, such as viruses, the evolution of antibiotic resistance, and climate change impact us all. Not for Biology major credit. **Prerequisites:** None

151—Introductory Biology (4 cr.)
(BS) Phillis, Morrill 3 404A; Francis, Morrill2 348A
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.)
(BSL) Rounds, Morrill2 354; Healey, Morrill2 356A; Houlihan, Morrill 2 352; Zehnder, Morrill2 348C
Lecture. Second semester of a full semester course for science majors. Topics include plant and animal structure and physiology, evolution, and ecology.
Prerequisite: A grade of C or better in BIOL 151 (strictly enforced)

153—Introductory Biology Lab (2 cr.)
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).

162H—Quantitative Systems Biology (4 cr.)
Riley, Morrill3 304A
Applies the theme of modeling and hands-on experimentation to core concepts in evolution, physiology, and ecology. Cutting-edge research in each of these fields relies heavily on quantitative approaches to understand how organisms' function, interact with their environments, and change over evolutionary time. This course uses a combination of lectures that integrate applied math and the study of organism-level systems and labs in which students use in silico, in vitro and in vivo models to investigate those systems in detail. The course will be organized into three modules that flow naturally from one to the next: evolution (the genotype), comparative physiology and functional morphology (the phenotype), and ecology (organismal and environmental interactions).

280—Evolution: Diversity of Life Through Time (3 cr.)
Porter, Morrill1N 440
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: C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162FH.

284 – General Genetics Lab
Chilufya, Morrill 2 348B
Various classical and molecular genetic techniques using various prokaryotic and eukaryotic systems such as bacteria, yeast, plants, and humans. The lab exercises will be largely inquiry based with a focus on experimental design. Laboratory projects include genetic crosses, analysis of the genotype/phenotype relationship, complementation, linkage mapping, and detection of DNA polymorphisms. Also, bioinformatics tools will be used to perform SNP analysis and analyze sequence similarity.
Prerequisites: C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162H; BIOL 311 (C or better)

285—Cell & Molecular Biology (3 cr.)
Rounds, Morrill2 354
Course designed for sophomores in Biology, Biochemistry, or Microbiology. Building upon concepts learned in Biology 100/101, consideration is given to structure and function. The course is equally divided between aspects of molecular and cellular biology.
Prerequisites: C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162H AND CHEM (111 or 121H) AND CHEM (112 or 122H) with a grade of 'C' or better.

287—Introductory Ecology (3 cr.)
Seidler, Morrill1N 239B
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: C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162H

288—Introductory Physiology (3 cr.)
Lonthair, Morrill3 348B
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: C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162H.

311—General Genetics (3 cr.)
Chilufya Morrill 2 348B; Moscarella, Morrill 2 350
Introduction to genetics including Mendelian, cytological, molecular, developmental, and population genetics. Examples from a wide variety of organisms. **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.)
Section 1 Spracklen, Morrill2 348B
Section 2 Lonthair, Morrill3 348B
Section 3 TBD
Section 4 Brewer, Morrill3 311A
Section 5 TBD
Section 6 Okusu, Morrill 2 140

Satisfies Junior Year Writing requirement for Biology majors. Students write and revise short papers on subjects likely to be encountered by biologists. Class discussion of papers. Prerequisites: 3 biological science courses, for declared Biology majors only.

372—Intro Neurobiology (3 cr)
Vazey, Morrill4S 368A, Cuadra, LSL N240
Do you ever wonder how your brain is organized? How neurons communicate with one another, and function together, or what goes wrong in different neurological diseases. This course is an introductory survey into neurobiology, from molecular and cellular mechanisms to nervous system organization and animal behavior. We will delve into foundational knowledge about nervous system anatomy, physiology, connectivity, and function that can be built upon in future upper level courses. This course fulfills the IE criteria by requiring collaborative problem-solving using real-word bioinformatic tools, and developing oral and written communication skills.
This course is not-for-credit for those who have previously taken Psych 330 or Biol 572.

401—Great Papers in Biology (3 cr.)
Stephens, Morrill4 454
Most courses present the prevailing wisdom of the field as artistically rendered figures that summarize a large body of information and present it as dogma. However, that's not how the field advances. Breakthroughs occur when researchers publish original research papers in peer-reviewed journals. Sometime the importance of the work is obvious at the time of publication and sometimes it takes many years for the true significance of the work to be appreciated. The Great Papers in Biology course is designed to allow students to read seminal papers in biology with the goals of 1) understanding, in detail, how the experiments were conducted; 2) how the results were interpreted; and 3) how the work changed scientists' understanding of biology. Papers to be discussed will represent a wide range of fields within Biology, including developmental biology, genetics/genomics, neuroscience, cell biology, and the mechanisms of disease.
Prerequisites: Open to Junior and Senior Biology Majors Only

424—Marine Biology (4 cr.)
Okusu, Morrill 2 140
This course introduces life in the sea from ecological and evolutionary perspectives. 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 topics including reproduction, embryology, paleontology, metazoan body-plan evolution, evolution of development, and phylogeny.

427—How to Make the Perfect Plant (3 cr.)
Bartlett, Morrill4S 374B
There are a mind-boggling 400,000 species of plants on earth, with new species discovered every year. Plants have evolved over hundreds of millions of years to efficiently capture the sun's energy and cycle oxygen in the atmosphere. How did this diversity come to be, and why are plants so varied

in form and function? Explore the plants of the world in a hands-on laboratory setting using live temperate and tropical plants from the UMass greenhouses and forests. You will use this new-found knowledge to study your favorite plant in an independent project for the web.

475—Plant Cell Biology (3 cr.)
Facette, Morrill4S 375D
This course will cover the cell biological aspects of several plant cellular processes, including cytokinesis, cell expansion, tip growth, cell-to-cell communication, and intracellular protein sorting. An emphasis will be made on experimental approaches used to understand these processes at the molecular level. A discussion of model organisms and cell types will be included.

476—Evolutionary Genomics and Bioinformatics (3 cr.)
Blanchard, Morrill3 409A
This course provides an introduction to evolutionary genomics, bioinformatics and data sciences skills for life science students. Computer-based lab sessions provide training in data science skills (Python, reproducible research, and cloud computing) and analytical methods related to DNA sequence searches, sequence alignment, detecting variation, phylogenetics, comparative genomics and genome visualization. The discussion section goes deeper into these methods and their applications in recent evolutionary genomics literature. A final project involving data from researchers on campus ties together the conceptual and computational foundations of the course.

484—Cancer Genetics (3 cr.)
Phillis, Morrill3 404A
Cancer Genetics is a team-based learning course that requires students to create proposals for novel treatments for specific kinds of cancer. Students analyze the research literature to identify unaddressed opportunities for treatment based on specific criteria pertaining to the genetic defects causing disease. They then must design a novel treatment using accepted genetic methods and drug delivery systems currently used in research and clinically.

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.

514—Population Genetics (3 cr.)
Caicedo, LSL N425
This course focuses on the processes affecting the distribution of genetic variation in populations of organisms, through space and time. The processes studied are the ones that operate during evolutionary change. Topics covered will include the Hardy-Weinberg principle, gene flow, genetic drift, recombination and linkage disequilibrium, natural selection, the effect of mating systems on diversity, and the neutral theory of evolution. Examples illustrating key concepts will be drawn from various kingdoms of life. The course will consist of lectures and in class discussions. With Biology 494LI, this course satisfies the Integrative Experience requirement for BS-Biol majors.
Prerequisites: Biology 280 or 283, plus Math 127 or 128 or Statistics 111 or 240 or ResEcon 211 or 212.

523—Histology (4 cr.)

Spracklen, Morrill2 348B
In this course we explore the cellular structure and function of human tissues and organ systems. The laboratory component offers a unique opportunity for you to develop and refine your skills in microscopy and visual identification of cells, tissues, and organs as well as tissue sectioning, staining, immunohistochemistry, and imaging. This includes a semester-long group project where you will prepare samples, section, stain, and analyze an organ of your choice and explore how the histology of this organ is altered by disease. This course provides a strong background for those interested in pursuing a career in health sciences or graduate school in cell biology, morphology, or physiology. With Biology 494LI, this course satisfies the Integrative Experience requirement for BS-Biol students.
Prerequisites: Open to Biology Majors Only; C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162H

544—Ornithology (4 cr.)
Byers, Morrill3 216A
Avian systematics, phylogeny, behavior, ecology, etc. Lab includes bird identification, anatomy, censusing, field studies.
Prerequisite: upper level biology course.

548—Mammalogy (4 cr.)
Moscarella, Morrill2 350
With lab. Lectures and readings on comparative biology and evolutionary relationships of mammalian groups. Lab involves detailed introduction to the New England mammalian fauna and study of selected representatives of other groups, emphasizing adaptation. Prerequisite: any life science course beyond the introductory level.
Prerequisites: any life science course beyond the introductory level; BIOL 280 & 287 highly recommended.

550—Animal Behavior (4 cr.)
Houlihan, Morrill2 352
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 worlds? 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.
Prerequisites: An Introductory Level Biology or Psychology Course

552—Neural Basis of Animal Behavior (3 cr.)
Katz, Morrill3 412
Neuroethology is the study of the neural basis of natural behavior. This lecture course will cover topics that include the neural mechanisms underlying predatory behavior and prey escape responses, specialized senses such as magnetoreception and electroreception, echolocation, animal communication, and animal navigation**.**

559—Cell Biology II (3 cr.)
Fritz-Laylin, Morrill4 455
This course is divided into 3 parts. Each part will include content-based learning in which we examine several aspects of cell biology using lectures, discussion of experimental results and

materials from the textbook. Topics will include exocytosis, actin & microtubule cytoskeleton, motors, and mitosis. Each part will also include inquiry-based learning where you will work in groups on a short research project to understand the cellular and molecular basis of a human genetic disease. Each group will investigate 3 aspects of their assigned disease: (1) the cell biology of the organelle or process that is disrupted, (2) the gene product that is defective, and (3) the experimental methods that scientists are using to understand, treat or cure the disease. This inquiry-based learning will culminate in each group presenting their work to the class and writing a short report summarizing their findings.

564—Human Physiology (3 cr.)
Padilla, LSL N227
Mechanisms underlying organ system function in vertebrates; nervous, endocrine, cardiovascular, respiratory, muscular, digestive, excretory, reproductive systems.
Prerequisites: BIOL 285 OR BIOCHEM 275/285 (C or better)

567—Comparative Physiology (4 cr.)
Irschick, Morrill3 205C
With lab. Lectures cover the physiology of animals on a system by system basis (e.g. circulatory system, digestive system, etc.) with an emphasis on the vertebrates. Comparisons between animals within each system and adaptations to "extreme" environments are emphasized. Weekly problem sets provide practice in physiological reasoning for each system covered.
Prerequisites: C or better in BIOL 151 or 161H AND a C or better in BIOL 152 or 162H

579—Developmental Neurobiology (3 cr.)
Pallas, Morrill2 418B
Please see SPIRE for course description.

583—Advanced Genetics (3 cr.)
Hazen, LSL N427
In this course, students will study the molecular genetics of inherited disease in humans. Students will use and build on foundational knowledge to gain a broad and deep understanding of the genetic, molecular, cellular and physiological basis for disease. Using individual critical thinking and combined team work, students will discover what is currently known about particular inherited diseases, what are the gaps in our understanding of disease, and will identify barriers to progress in disease treatment. Students will integrate and apply lower divisions course knowledge and further build critical thinking skills by engaging in challenging biomedical topics.

586—Cellular Biology of Disease (3 cr.)
Francis, Morrill2 348A
In this upper level class, we will study the cellular basis of disease using a project based format. The class will begin with a discussion of the tools used to study cells, including molecular methods such as CRISPR. Cell and tissue structures and function will be discussed. The remainder of the class will be spent investigating diseases that result from defects in single genes -- two common examples are cystic fibrosis and sickle cell anemia. Students will read the primary literature as well as other sources. Evaluation will be based on presentations, written reports, comments on readings, and class participation.

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**

R. Craig Albertson, Professor
Evolutionary Developmental Biology
albertson@bio.umass.edu **Mor2 336**

Courtney Babbitt, Associate Professor
Evolutionary Genomics
cbabbitt@bio.umass.edu **Mor4S 362**

Madelaine Bartlett, Professor
Plant Evo-Devo
mbartlett@bio.umass.edu **Mor4S 374B**

Tobias I. Baskin, Professor
Regulation of Plant Morphogenesis During Growth & Development
baskin@bio.umass.edu **Mor4S 375F**

Jeffrey Blanchard, Associate Professor
Anaerobic Microbiology, Microbial Ecology and Evolution, Genomics, Bioinformatics
jeffb@bio.umass.edu **LSL N571**

Steve D. Brewer, Assistant Professor
Science Education/Instructional Technology
sbrewer@bio.umass.edu **Mor3 311A**

Bruce E. Byers, Associate Professor
Songbird Vocalizations
bbyers@bio.umass.edu **Mor3 216A**

Ana Caicedo, Professor
Plant Molecular Evolution and Evolutionary Genomics
caicedo@bio.umass.edu **LSL N425**

Gerald Downes, Professor
Motor Behavior and Epilepsy
gbdownes@bio.umass.edu **Mor1 N210**

Michelle Facette, Assistant Professor
Plant Biology
mfacette@umass.edu **Mor 4S 375D**

Karine Fenelon, Assistant Professor
Synaptic Transmission and Neural Circuits Underlying Sensory Information Filtering
kfenelon@umass.edu **LSL N233**

Laura Francis, Senior Lecturer
Molecular Mechanisms
lif@bio.umass.edu **Mor2 348A**

Lillian Fritz-Laylin, Professor
Quantitative Evolutionary Cell Biology
lfritzlaylin@umass.edu **Mor2 330**

Alexander Gerson, Associate Professor
Integrative Eco-physiology – Environmental Physiology of Birds
argerson@bio.umass.edu **Mor3 318A**

Samuel P. Hazen, Professor
Regulatory Networks & Natural Variation in Plant Cell Wall
hazen@bio.umass.edu **LSL N427**

Christiane Healey, Senior Lecturer
Ecology, evolution and animal behavior
cihealey@bio.umass.edu **Mor2 356A**

Peter Houlihan, Senior Lecturer II
Animal Behavior, Vertebrate Ecology and Conservation Biology
peteh@bio.umass.edu **Mor2 352**

Duncan Irschick, Professor
Functional Morphology, Evolution and Behavioral Ecology
irschick@bio.umass.edu **Mor3 205C**

Elizabeth Jakob, Professor/Assoc Dean of the Grad School
Behavioral Ecologist
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