Biology Advisement Packet

Biological Sciences
• General Biology
• Biomedical Sciences
• Environmental Biology
• Microbiology
• Biology Licensure

Marine Biology
How can I find the requirements for my degree specialization?

http://catalog.usm.edu/

Click here

Click here

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Click on your degree plan
Should I take MATH 114 or MATH 167?

**MAT 114: Calculus for Arts and Sciences**
Prerequisite(s): Math ACT ≥ 24 or a grade of C or better in **MAT 101**. An introduction to differential and integral calculus, with applications to the arts and life sciences.

**MAT 167: Calculus I with Analytical Geometry**
Prerequisite(s): Math ACT ≥ 26 or a grade of C or better in **MAT 103** or **MAT 128**. Limits, Derivatives, Applications of the derivatives.

If you are a biology major satisfying a biology requirement, you should take MAT 114. You should take MAT 167 if you intend to continue on to take Calculus II (MAT 168), and/or if it is a requirement for a second major or minor. For instance, if you plan to take CHE 461 Physical Chemistry as a component of a Chemistry minor, you must take MAT 168.

Students may enroll in MAT 114 if their ACT mathematics subtest score is 24 or higher. Students enrolling in MAT 167 must have an ACT mathematics subtest score of 26 or higher. Students entering USM with an ACT mathematics subtest score of 20 to 23 must complete MAT 101 (College Algebra) with a C or better before taking MAT 114. Students entering USM with an ACT mathematics subtest score of less than or equal to 19 must take MAT 099 (Intermediate Algebra) during their first semester and earn at least a C prior to enrolling in MAT 101 (which must also be completed satisfactorily prior to enrolling in MAT 114). MAT 103 (Trigonometry) is recommended for students lacking a good background in mathematics.
Biological Sciences, B.S (no emphasis)

Biology core requirements

- BSC 110/L, BSC 111/L, BSC 197, BSC 201/L, BSC 226/L, BSC 340, BSC 360, BSC 370, BSC 380/L, BSC 497

Physiology elective (choose 1)

- BSC 450, BSC 451, BSC 452, BSC 487/L

Upper level lab requirements (need minimum of 3 300+ level BSC laboratory courses)

- BSC 361/L, BSC 380/L, BSC 404/L, BSC 407/L, BSC 410/L, BSC 411/L, BSC 412/L, BSC 414/L, BSC 417/L, BSC 418/L, BSC 426/L, BSC 430/L, BSC 432/L, BSC 433/L, BSC 434/L, BSC 435/L, BSC 436/L, BSC 439/L, BSC 441/L, BSC 444/L, BSC 445/L, BSC 461/L, BSC 469/L, BSC 477/L, BSC 478/L, BSC 484/L, BSC 486/L, BSC 487/L, BSC 488/L, BSC 489/L

Chemistry/Physics/Statistics/Math

- CHE 106/L, CHE 107/L, CHE 255/L
- CHE 256/L OR CHE 420/L
- PHY 111/L PHY 112/L
- PSY 360
- MAT 114 OR MAT 167
Biological Sciences, B.S  
(Biomedical Sciences emphasis)

**Biology core requirements**
- BSC 110/L, BSC 111/L, BSC 197, BSC 201/L, BSC 305, BSC 360, BSC 370, BSC 380/L, BSC 486/L, BSC 497

**Technology elective (choose 1)**
- BSC 476, BSC 478/L, BSC 491/L

**Systems elective (choose 1)**
- BSC 361/L, BSC 407/L, BSC 410/L, BSC 461/L, BSC 469/L, BSC 472

**Pathophysiology and Microbiology Elective**
- BSC 410/L, BSC 412/L, BSC 463, BSC 477/L, BSC 481, BSC 484/L, BSC 487/L

**Chemistry/Physics/Statistics/Math**
- CHE 106/L, CHE 107/L, CHE 255/L, CHE 256/L
- CHE 420/L OR CHE 421/L
- PHY 111/L PHY 112/L
- PSY 360 OR DPH 440
- MAT 114 OR MAT 167
- PSY 110, SOC 101
Biological Sciences, B.S  
(Environmental Biology emphasis)

Biology core requirements
•  BSC 110/L, BSC 111/L, BSC 197, BSC 201/L, BSC 226/L, BSC 305, BSC 340, BSC 370, BSC 380/L, BSC 497

Physiology elective (choose 1)
•  BSC 360, BSC 450, BSC 451, BSC 452, BSC 487/L

Ecology elective (choose 1)
•  BSC 382, BSC 435/L, BSC 472, BSC 489/L

Organismal electives (choose 2)
•  BSC 407/L, BSC 411/L, BSC 414/L, BSC 417/L, BSC 418/L, BSC 426/L, BSC 430/L, BSC 433/L, BSC 434/L

Ecosystems elective (choose 1)
•  BSC 436/L, BSC 441/L, BSC 444/L, BSC 445/L

Chemistry/Physics/Statistics/Math
•  CHE 106/L, CHE 107/L, CHE 255/L
•  CHE 256/L OR CHE 420/L
•  PHY 111/L PHY 112/L
•  PSY 360
•  MAT 114 OR MAT 167
Biological Sciences, B.S
(Microbiology emphasis)

Biology core requirements
• BSC 110/L, BSC 111/L, BSC 197, BSC 370, BSC 380/L, BSCV 484/L, BSC 486/L, BSC 477/L, BSC 478/L, BSC 497

Required elective 1 (choose 1)
• BSC 478/L, BSC 481, BSC 488/L, BSC 489/L

Required elective 2 (choose 1)
• BSC 382, BSC 476,

Required elective 3 (choose 2)
• BSC 360, BSC 410/L, BSC 412/L, BSC 426/L, BSC 463

Chemistry/Physics/Statistics/Math
• CHE 106/L, CHE 107/L, CHE 255/L, CHE 256/L, CHE 421L
• PHY 111/L PHY 112/L
• MAT 114 OR MAT 167

Chemistry elective (choose 1)
• CHE 422, CHE 451, CHE 460, CHE 470
Biological Sciences, B.S
(Licensure emphasis)

Biology core requirements
• BSC 110/L, BSC 111/L, BSC 197, BSC 201/L, BSC 226/L, BSC 340, BSC 360, BSC 370, BSC 380/L, BSC 495/L

Physiology elective (choose 1)
• BSC 450, BSC 451, BSC 452, BSC 487/L

Upper level lab requirements
(need minimum of 3 300+ level BSC laboratory courses)
• BSC 361/L, BSC 380/L, BSC 404/L, BSC 407/L, BSC 410/L, BSC 411/L, BSC 412/L, BSC 414/L, BSC 417/L, BSC 418/L, BSC 426/L, BSC 430/L, BSC 432/L, BSC 433/L, BSC 434/L, BSC 435/L, BSC 436/L, BSC 439/L, BSC 441/L, BSC 444/L, BSC 445/L, BSC 461/L, BSC 469/L, BSC 477/L, BSC 478/L, BSC 484/L, BSC 486/L, BSC 487/L, BSC 488/L, BSC 489/L

Chemistry/Physics/Statistics/Math
• CHE 106/L, CHE 107/L, CHE 255/L
• CHE 256/L OR CHE 420/L
• PHY 111/L PHY 112/L
• PSY 360
• MAT 114 OR MAT 167

Licensure requirements
• CIS 302, CIS 313, HIS 101, HIS 102, CISE 365, PSY 110, REF 469, SME 489, SME 490, SPE 400

Humanities elective (choose 1)
• ANT 101, GHY 101, SOC 101
Marine Biology, B.S

Biology core requirements
- BSC 110/L, BSC 111/L, BSC 197, BSC 201/L, BSC 370, BSC 380/L, BSC 445/L, BSC 497

Physiology elective (choose 1)
- BSC 360, BSC 450, BSC 451, BSC 452

Required elective 1 (choose 1)
- BSC 382, BSC 407/L, BSC 414/L, BSC 430/L, BSC 436/L, BSC 441/L, BSC 478/L, BSC 487/L, BSC 489/L

Chemistry/Physics/Statistics/Math
- CHE 106/L, CHE 107/L, CHE 255/L
- CHE 256/L OR CHE 420/L
- PHY 111/L PHY 112/L
- PSY 360
- MAT 114 OR MAT 167

Gulf Coast Research Laboratory (choose 2)
- COA 416/L, COA 421/L, COA 422/L, COA 424/L, COA 428/L, COA 433/L, COA 434/L, COA 435/L, COA 443/L, COA 446/L, COA 447/L, COA 453/L, COA 456/L, COA 465/L, COA 471/L
Medical Entomology
BSC 412/412L

Overview of insects and other arthropods that impact human and animal health. Special interest will be given to insects that transmit Pathogens.

Lecture: Mondays and Wednesdays, 1:15-2:45 p.m.
Laboratories: Wednesday, 3:00-6:15 p.m.

Instructor: Shahid Karim
Herpetology is the study of reptiles (snakes, lizards, turtles, crocodiles) and amphibians (frogs, salamanders). In this course, we will learn all about the ecology, evolution, and natural history of these fascinating animals.

The corequisite lab (417L or 517L) will include hands-on activities in the field and in the laboratory, to learn methods of finding, catching, identifying, and studying amphibians and reptiles.

Instructor:
Dr. Carl Qualls
JST 414
601-266-6906
Carl.Qualls@usm.edu

Course Meets:
Walker Science Building 153
MW 1:15-2:45
Mon 3:00-6:15
This is an introductory course in the biology, taxonomy and ecology of fungi and fungal-like organisms.

Major topics that will be covered:
• Structural and functional aspects of fungi and fungal-like organisms (both saprophytic and pathogenic)
• Basic techniques of isolation, culture and identification of fungi
• General aspects of fungal physiology and ecology

Questions - Contact: Dr. Kevin Kuehn
(kevin.kuehn@usm.edu)
DO YOU LIKE DONUTS?
ARE YOU WEARING JEANS?
DO YOU USE HOT WATER WARMED BY ELECTRICITY DERIVED FROM FOSSIL FUELS?
DOES POLLEN MAKE YOU ITCHY?

If you answered “YES” to any of these questions, and have had a botany course, then you meet all of the prerequisites for Economic Botany. This course explores the historic and current human uses of plants including food, fiber, wood, oils, spices, and medicines. Labs will be designed to introduce students to the impacts of plants on the local economy.
Plant Systematics (BSC 433 and 433/L)
(4 credit hours)

Lecture:
Laborstory: Tuesday and Thursday mornings, 8:00–

Prerequisite: General Botany and Lab (BSC 226/L)

Students will learn how to identify and classify the major groups of lycopsods, ferns, horsetails, gymnosperms, and flowering plants. In addition to the practical skills of identification using morphological features, the class will also cover species concepts and delimitation in plants, inferring phylogenetic relationships, and rules of nomenclature. In lab, students get the opportunity to see interesting species and plant communities in our area, including longleaf pine savannah, pitcher plant bogs, mesic hardwood ravines, prairie, marsh, and sandhills.
Marine Biology
BSC 445/BSC 445L
Spring 2019
Lecture: Tu & Thu 1:15-2:45
Labs: Tu 3:00-6:15 or 6:30-9:45
Course Objectives:
Upon completion of the course students should be able to explain the fundamental principles of organismic function and adaptations across major animal groups.

These explanations should include systems, cellular, and molecular levels of organization.
Environmental Physiology
BSC 452

MW 11:30-1:00
Questions: email jake.schaefer@usm.edu

• Course Objective – An understanding of plant and animal physiological adaptations to environmental extremes.

• Course Topics (subject to change)
  • Introduction, environment and adaptation
  • The comparative method and adaptation
  • Allometry
  • Osmoregulation - aquatic and terrestrial systems
  • Energetics and Metabolism
  • Respiration, Circulation and buoyancy – aquatic and terrestrial adaptations
  • Temperature, thermoregulation and endothermy - aquatic and terrestrial adaptations
  • Ecology of cycles and seasonality - aquatic and terrestrial adaptations
  • Sensory Systems - aquatic and terrestrial adaptations
  • Ecography – energetics and observed patterns of ecological diversity
Microscopic anatomy of mammalian organ systems with related cell biology

Lecture: Dr. John Bailey
MWF: 9:45am - 10:45am

Lab: Dr. Yanlin Guo
Thurs.: 3:00pm – 6:15pm
Population genetics is concerned with the processes that affect the patterns of genetic variation within a species (i.e. how evolutionary changes occur). Topics will include:
- sources of variation, population structure, genetic drift, inbreeding, selection, molecular evolution, systematics, conservation genetics and quantitative genetics.
Course Objectives

- Cloning methods
  *PCR strategies, reverse transcription, vector creation*

- Methods of transgenesis
  *Transformation, transfection, genome engineering*

- Strategies to assess altered genetics
  *qPCR, protein analysis, genome/transcriptome/proteome-wide technologies*
Microbial Genetics
BSC 477 and 477L

Course Objectives
An overview of the genetics of bacteria, archaea, and viruses.

Lecture:
MW 11:30-1:00

Lab
M 3:00-6:15

Email:
dmitri.mavrodi@usm.edu
Immunology and Serology
BSC 486/L 586/L
Every Spring: 3/1 hrs
Questions: email fengwei.bai@usm.edu

Immunology is the foundation to understand human diseases

Course Objectives

• Understanding functions of innate, cellular and humoral immunity.
• Understanding how these components provide immune defense against pathogens.
• Understanding how the immune system may damage self tissues resulting in diseases.
Coastal & Marine Management
BSC 422
(BSC 492 H029)
Spring 2019
Lecture: Mo & Wed 8:00 - 9:30 AM

Undergraduate prerequisite: 12 credit hours of BSC courses
Contact: Dr. Nicole Phillips
N.Phillips@usm.edu
Tropical Ecology is a life-changing course!

BSC 404/404LCA (7272) & 504/504LCA (7495) will be offered the 2nd 8 weeks of Spring 2019, Mon/Wed 1:15–2:45 p.m. with travel to Belize May 17–31, 2019

More info: Mr. Michael Sellers (johnny.sellers@usm.edu), Dr. Mac Alford (mac.alford@usm.edu), or Dr. Nicole Phillips (n.phillips@usm.edu)

Scholarships are available, and all majors are encouraged to apply at studyabroad.usm.edu
‘Sprinkles’ are the extra things you do to increase your odds of success at the next level. Here are some ‘sprinkles’ to help build a resume beyond the classroom:

• Volunteer activities
• Internships
• Research activities
• Study abroad experiences
• Student clubs

How do I find opportunities:

• Biology Website
  https://www.usm.edu/biological-sciences
• Pre-professional Website
  https://www.usm.edu/arts-sciences/preprofessional
• Follow the Biological Sciences Facebook
• Visit your professors during office hours
• Ask your academic adviser
• Career Development Center
How do I get involved in research activities?

Talk to your professors! We want you to work in our labs. Express your interests to your professors, and ask them if they have space in their labs. Be aware that professors may have the following constraints:
• Professor’s labs may already be full for a given semester (ask early).
• Professors may have specific course prerequisites for their lab research.
• Professors may have specific time availability expectations for students.

If you are not able to get into the first lab you inquire about, don’t give up. There are lots of labs in our department, and any research activity is great experience.
Clubs

Alpha Epsilon Delta, Pre-professional Society
American Medical Student Association
Beta Beta Beta, Biology Honor Society
Marine Conservation Club
Roots and Shoots
Southern Miss Horticulture Club
Women in Science and Engineering