

ASTRONOMY • BIOLOGICAL SCIENCES

BEFORE ENROLLING IN DEGREE APPLICABLE COURSES, IT IS RECOMMENDED THAT YOU COMPLETE ENGL 001A AND READ 053.

ASTRONOMY (ASTRO)

DIVISION: Math and Science
DEAN: Danny Nguyen
DIVISION CHAIR: Thais Winsome
DEPARTMENT: Astronomy
DEPT CHAIR: Dr. Clint Poe
PHONE: 408-855-5262

The courses in Astronomy are offered as part of the general education program at Mission College. The astronomy courses includes a laboratory and complies with general education transfer requirements. The courses are an excellent way for the liberal arts student to gain an appreciation of scientific knowledge and methods.

Student Learning Outcomes:

Students will be able to apply the scientific method to observations to understand how the universe is structured.

Physical Science - A.S. Degree

To earn an A.S. Degree in Physical Science, a minimum of 18 units of course work, distributed among the following courses must be completed:

Select 18 units from the following:	Units
Astro 001 .....Astronomy	3.0
Astro 002 .....Astronomy Lab	1.0
CHEM 001AB ....General Chemistry.....	5.0 each
CHEM 002 .....Introductory Chemistry	4.0
CHEM 005 .....Quantitative Analysis	4.0
CHEM 030AB .....Fundamentals of Chemistry.....	3.0 each
PHYS 002AB .....General Physics	5.0 each
Phys 004A .....Engineering Physics - Mechanics.....	5.0
Phys 004B .....Engineering Physics - Electricity and Magnetism.	5.0
Phys 004C .....Engineering Physics - Light and Heat	5.0
Phys 004D .....Atomic Physics	2.0
Phys 010.....Introduction to Physics	4.0
Total Program A.S. Degree Requirements:	18.0

ASTRONOMY (ASTRO)

001 • ASTRONOMY 3.0 units

Total Lecture: 54 hours

Advisory: MATH 903

Acceptable for credit: University of California, California State University

This course is a descriptive astronomy lecture only course covering the entire panorama of the universe, including early human observations, the origin and structure of the solar system, and the properties, origin and evolution of stars, galaxies and cosmology. Grade Only.

002 • ASTRONOMY LABORATORY 1.0 unit

Total Lab: 54 hours

Advisory: MATH 903

Prerequisite/Corequisite: ASTRO 001

Acceptable for credit: University of California, California State University

This course offers practical experience in astronomical projects using lab equipment and computers, reinforcing the concepts introduced in descriptive astronomy lectures. The emphasis is on collecting and manipulating astronomical data to infer the nature of the universe. Materials Fee. Grade Only.

003 • ASTRONOMY 4.0 units

Total Lecture: 54 hours, Total Lab: 54 hours

Advisory: MATH 903

Acceptable for credit: University of California, California State University

This course covers the entire panorama of the universe from the observations of the night sky to the origin and structure of the planets, stars, galaxies and the universe. The lab portion of the course includes practical experience with the methods of astronomy using computers and other equipment. Grade Only.

BIOLOGICAL SCIENCES (BIOSC)

DIVISION: Math and Science
DEAN: Danny Nguyen
DIVISION CHAIR: Thais Winsome
DEPARTMENT: Biological Sciences
DEPT CHAIR: Kelly Neary
PHONE: 408-855-5588
COUNSELING: 408-855-5030

The Biological Sciences Department provides students with a comprehensive foundation in the life sciences, promotes environmental awareness and careful stewardship of earth's resources, and fosters scientific literacy to enable our students to function well in a world increasingly influenced by science and technology. We offer degree and transfer programs in the biological sciences, provide prerequisite courses for degree programs in allied health, and courses that satisfy General Education requirements for students planning to transfer to colleges and universities. Our emphasis is upon delivering high-quality instruction in an inclusive, positive learning environment that facilitates success for all students.

Students who complete the A.S. degree in Biological Sciences will be able to:

- Communicate effectively using the language, concepts and models of biology.

- Use the scientific method to define and solve problems independently and collaboratively.

- Use a wide variety of laboratory and field techniques with accuracy, precision and safety.

- Demonstrate proficient library, mathematical and computer skills in data gathering and analysis.

- Apply scientific concepts to environmental and societal issues.

- Explain basic evolutionary principles and their relationship to adaptation and biodiversity.

Career Options Include:

- Nursing •Dentistry •Ecology

- Medicine •Physical Therapy •Resource Conservation

- Pharmacy •Research •Science Education

Some career options may require more than two years of college study. Classes beyond the Associate Degree level may be required to fulfill requirements for some degree programs. Students planning to transfer to a degree program should consult the lower-division requirements of the transfer program of the university to which they plan to apply to ensure that they meet all requirements before transfer.

Program Highlights

Biological Sciences at Mission College specializes in small class size and personal attention. Our modern lab facilities provide students with a safe, comfortable learning environment. Highlights of our program include:

- Transferable courses

All majors and non-majors courses (with the exception of directed studies courses) are fully transferable to UC and CSU.

- Convenient class times

We offer day, evening, and weekend sections of our most popular courses. We also offer online sections of many of our courses.

- Health Sciences

We offer all prerequisite biology for entrance into the RN and LVN nursing programs. We have an evening program for pre-nursing prerequisites tailored to the working student.

- Biology Majors Program

The Division of Natural Sciences now offers all lower-division prerequisite courses in Biology, Chemistry and Physics for those seeking to transfer to a 4-year institution.

- General Education

Non-majors courses cover topics that are of current interest and relevant to students' lives.

- Study abroad.

Our popular Tropical Ecology course (BIOSC 030) offers students the opportunity to study the ecology and culture of Costa Rica.

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Biological Sciences - Associate in Science

To earn an A.S. Degree in Biological Science a minimum of 18 units of course work, distributed among the following courses, must be completed:

Select 18 units from the following:	Units
ANTHR 001 .....Physical Anthropology	3.0
BIOSC 001A .....General Biology: Cells	5.0
BIOSC 001B .....General Biology: Organisms	5.0
BIOSC 004 .....Microbiology	5.0
BIOSC 010 .....Introduction to Biology	4.0
BIOSC 011 .....Human Biology	4.0
BIOSC 015 .....Human Heredity and Disease	3.0
BIOSC 016 .....Marine Biology	4.0
BIOSC 025 .....Environmental Biology	3.0
BIOSC 030 .....Tropical Ecology	4.0
BIOSC 041 .....Principles of Evolution and Animal Biology	5.0
.....or	
BIOSC 001B .....General Biology: Organisms	5.0
BIOSC 042 .....Principles of Plant Biology	5.0
.....or	
BIOSC 001B .....General Biology: Organisms	5.0
BIOSC 043 .....Principles of Cell and Molecular Biology	5.0
.....or	
BIOSC 001A .....General Biology: Cells	5.0
BIOSC 047 .....Human Anatomy	5.0
BIOSC 048 .....Human Physiology	5.0
NS 015 .....Human Nutrition	3.0

NOTE: BIOSC 001A may be substituted for BIOSC 043, and BIOSC 001B may be substituted for BIOSC 041 or BIOSC 042, but not both. It is recommended that majors take as many of the core courses (041, 042, 043, 001A, 001B) as possible.

Total Units 18.0

BIOLOGICAL SCIENCES (BIOSC)

001A • GENERAL BIOLOGY: CELLS 5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours
Advisory: Eligibility for ENGL 001A and READ 053, CHEM 001B
Prerequisite: CHEM 001A and MATH 000C and BIOSC 010 or BIOSC 011 or BIOSC 015
Acceptable for credit: University of California, California State University
 This course is a comprehensive introduction to cell and molecular biology, and is designed for students pursuing degrees in biology or professional programs such as medicine or pharmacy. Topics addressed in lecture and lab include biochemistry, the structure and function of prokaryotic and eukaryotic cells, cellular metabolism, and prokaryotic and eukaryotic gene expression and regulation. This course may be offered via distance learning. Grade Only.

001B • GENERAL BIOLOGY: ORGANISMS 5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours
Advisory: Eligibility for ENGL 001A and READ 053
Prerequisite: BIOSC 001A
Acceptable for credit: University of California, California State University
 This course is a general introduction to the biological diversity of life, plant and animal form and function, and ecology. The course is designed for students majoring in the biological sciences or seeking entry to professional programs such as Medicine, Pharmacy, and Dentistry. Grade Only.

004 • MICROBIOLOGY 5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours
Advisory: Eligibility for ENGL 001A and READ 053
Prerequisite: CHEM 030A
Acceptable for credit: University of California, California State University
 This survey course in microbiology is intended for nursing and other health-science majors. Lecture topics include the morphology and physiology of the major groups of microorganisms, bacterial and viral genetics, mechanisms of infection and disease, and the human immune response to infection. Laboratory activities focus on techniques employed in the culture and identification of bacteria of medical importance. This course may be offered via distance learning. Grade Only.

007 • FIELD ECOLOGY 4.0 units

Total Lecture: 36 hours, Total Lab: 108 hours
Acceptable for credit: California State University
 This introductory level course will cover techniques that are used by naturalists to observe, identify, sample, and analyze a range of living organisms inhabiting aquatic and terrestrial environments. Lectures on basic ecological principles, taxonomy and techniques for observation and sampling will be held at Mission College. Students will be given a variety of hands-on opportunities to apply this knowledge, in day trips planned for locations around the Bay area and during their stays at active field research stations. Students will be responsible for their own trip costs and transportation arrangements. Pass/No Pass Option.

008 • EXPLORING BIOLOGY 3.0 units

Total Lecture: 54 hours
Acceptable for credit: University of California, California State University
 This is an introductory biology course designed for post-secondary students seeking to meet transfer and general education requirements or interested in personal enrichment. The course investigates a broad range of biology topics, concepts, and principles, such as the chemical basis of life, evolution, plant and animal biology, and ecology. It examines the scientific method and considers both its promises and limitations. This course may also be offered via distance learning. Pass/No Pass Option.

010 • INTRODUCTION TO BIOLOGY 4.0 units

Total Lecture: 54 hours, Total Lab: 54 hours
Advisory: Eligibility for ENGL 001A and READ 053
Acceptable for credit: University of California, California State University
 BIOSC 010 is an introductory course in biology designed for the non-biological sciences major. Topics include the following basic principles and stresses their applicability to a variety of plants and animals, as well as to humans: biological perspective and thought; organisms and their environments, structure, interactions, energy exchange and life processes; continuity through time, reproduction, heredity, diversification and evolution. Laboratory work may also include field trips. A passing grade in both lecture and laboratory work is required in order to receive credit for the course. This course may also be offered via distance learning. Materials Fee. Grade Only.

011 • HUMAN BIOLOGY 4.0 units

Total Lecture: 54 hours, Total Lab: 54 hours
Advisory: ENGL 108A and READ 053
Acceptable for credit: University of California, California State University
 This course is an introduction to biology, with an emphasis on human beings. The principles and concepts of biology are covered, including the scientific method, cells, genetics, evolution, ecology and basic anatomy and physiology of humans. BIOSC 011 satisfies the same general education requirement as BIOSC 010. This course may also be offered via distance learning. Pass/No Pass Option

015 • HUMAN HEREDITY AND DISEASE 3.0 units

Total Lecture: 54 hours
Advisory: MATH 903
Acceptable for credit: University of California, California State University
 This course is a broad survey of human genetics, with a focus on conditions and diseases with a genetic basis. It is designed for the general education student. This course may also be offered via distance learning. Pass/No Pass Option.

BIOLOGICAL SCIENCES

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016 • MARINE BIOLOGY

4.0 units

Total Lecture: 54 hours, Total Lab: 54 hours

Acceptable for credit: University of California, California State University

Marine Biology is an introduction to ocean environments and marine life. General ecological principles, biodiversity and marine conservation issues are emphasized. Human activities that modify ocean ecosystems are examined. Discussions include overviews of characteristics and the inhabitants of a variety of marine ecosystems, such as: rocky and sandy shores, estuaries, kelp forests, coral reefs, continental shelves, the open ocean and the deep sea. This field intensive course has seven required field trips in the San Francisco and Monterey bays, allowing students to investigate ocean life in our local marine environments. This four unit science course with lab is open to students of all majors. Grade Only.

022 • ANATOMY AND PHYSIOLOGY FOR ALLIED HEALTH WORKERS

4.0 units

Total Lecture: 54 hours, Total Lab: 54 hours

Advisory: MATH 903

Acceptable for credit: California State University

This course is an overview of the normal structure and function of the human body and is designed to provide a foundation for the study of disease and dysfunction in the clinical setting. Laboratory work includes dissection of preserved materials. BIOSC 022 is designed to meet the state board requirements for the vocational nursing and psychiatric technician programs. Grade Only.

025 • ENVIRONMENTAL BIOLOGY

3.0 units

Total Lecture: 54 hours

Advisory: Eligibility for ENGL 001A and READ 053

Acceptable for credit: University of California, California State University

This course provides a scientific examination of the ecological interrelationships between humans and the environment. By understanding general ecological principles and major ecosystems on earth, we can evaluate how the human population impacts our planet by its growth and resource use, and what the implications are for ecosystems, biodiversity, as well as human health and welfare. Topics include: human population growth, food and water supplies, pollution, global climate change, energy use and sustainable development. Grade Only.

030 • TROPICAL ECOLOGY

4.0 units

Total Lecture: 54 hours, Total Lab: 54 hours

Acceptable for credit: California State University

This introductory level course is designed for students of all disciplines, who are interested in learning about tropical ecology firsthand. The laboratory will be at field stations, e.g., Costa Rica. Principles of ecology, biodiversity, and conservation will be emphasized. The culture, economy, and public policy of the country visited and their relationship to resource conservation will be featured. Students will participate in naturalist-led hikes and design and carry out their own ecological experiments. Classes will be held at biological field stations with other required class meetings at Mission College. Students will be responsible for their own trip costs and for the purchase of items required for the trip. Pass/No Pass Option.

041 • PRINCIPLES OF EVOLUTION AND ANIMAL BIOLOGY

5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours

Advisory: Eligibility for ENGL 001A and READ 053, CHEM 001A Prerequisite: High School or College Biology course, MATH 000C and CHEM 002.

Acceptable for credit: University of California, California State University

This course introduces the principles of animal biology and evolutionary theory to the biology major. Topics in zoology include animal phylogeny, diversity, ecology, natural history, morphology, physiology, and development. Grade Only

042 • PRINCIPLES OF PLANT BIOLOGY

5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours

Advisory: Concurrent enrollment in CHEM 001B, Eligibility for ENGL 108A and READ 053

Prerequisite: High School or College biology course, MATH 000C and CHEM 001A

Acceptable for credit: University of California, California State University

This course for biology majors surveys basic principles of the plant sciences by examining all levels of biological organization. It provides an overview of plant diversity, ecology, evolution, morphology, anatomy, physiology, and biochemistry. Diversity and biology of fungi, algae, and cyanobacteria are included in this overview. Ecological principles are also discussed. Laboratory activities include microscopic work, experimental physiology, and studies of biodiversity, natural history and ecology. Field trips to several ecosystems in the Bay Area provide numerous opportunities to study local flora. Grade Only.

043 • PRINCIPLES OF CELL AND MOLECULAR BIOLOGY

5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours

Advisory: CHEM 001B, Eligibility for ENGL 001A and READ 053

Prerequisite: BIOSC 011 or BIOSC 041 or BIOSC 042 or equivalent course in College Biology and CHEM 001A and MATH 000C

Acceptable for credit: University of California, California State University

This course is a comprehensive introduction to cell and molecular biology, and is designed for students pursuing degrees in biology or professional programs such as medicine or pharmacy. Topics addressed in lecture and lab include biochemistry, the structure and function of prokaryotic and eukaryotic cells, cellular metabolism, functional characteristics of Bacteria, Archaea, and protists, and prokaryotic and eukaryotic gene expression and regulation. This course may be offered via distance learning. Grade Only.

047 • HUMAN ANATOMY

5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours

Advisory: Concurrent enrollment in BIOSC 047S, Eligibility for ENGL 001A and READ 053

Prerequisite: BIOSC 011 or BIOSC 022

Acceptable for credit: University of California, California State University

This course is an in-depth study of the microscopic and gross anatomical structure of the human body, including corresponding pathology. It is designed to meet the prerequisite for programs in nursing, physical therapy, human performance, occupational therapy, etc. Laboratory work includes, for example, examination of models, histological specimens, animal material, and human cadavers. This course may be offered via distance learning. Grade Only.

047S • HUMAN ANATOMY SUPPLEMENTAL LABORATORY

1.0 units

Total Lab: 54 hours

Corequisite: Concurrent enrollment in BIOSC 047 or completion of BIOSC 047 or the equivalent with a grade of "C" or higher.

This is a supplemental course designed primarily for students currently taking BIOSC 047 to work through tutorials with an anatomy instructor. Students who have already completed BIOSC 047, but who want to review the material, are also welcome. Pass/No Pass Only.

048 • HUMAN PHYSIOLOGY

5.0 units

Total Lecture: 54 hours, Total Lab: 108 hours

Advisory: MATH 000C or MATH 000CM, Eligibility for ENGL 001A and READ 053

Prerequisite: BIOSC 047 and CHEM 001A or CHEM 030A

Acceptable for credit: University of California, California State University

This course provides students with a basic understanding of the physiological mechanisms underlying body function in order to provide a foundation for more in-depth study and practical application. With an emphasis on cause and effect, details of the chemical and cellular basis for the workings of the nervous, muscular, cardiovascular, respiratory, renal and digestive systems are emphasized. Laboratory investigations of physiological processes familiarize students with scientific analysis and research techniques. Grade Only.

BIOLOGICAL SCIENCES • BUSINESS

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092E • SPECIAL PROJECTS IN ENVIRONMENTAL STUDIES 2.0 units

Total Arranged Lab: 96 hours

Advisory: BIOSC 025, Eligibility for ENGL 001A and READ 053.

In this hands-on course, student groups carry out research projects that address global problems by applying local solutions. Research is under the guidance of a faculty member and may include topics such as vermiculture, sustainable aquaponics, habitat enhancement, or burrowing owl conservation. Topics are determined in consultation with the instructor and the members of the student's team and are different each semester. This course is also listed as GLOBL 092E. *Pass/No Pass Option.*

BUSINESS (BUS)

DIVISION: Business and Technology
 DEPARTMENT: Business
 DEAN: Mina Jahan
 DIVISION CHAIR: Curtis Pembrook
 DEPT CHAIR: Jim Van Tassel
 PHONE: 408-855-5344
 COUNSELING: 408-855-5030

Business skills are applicable to a wide range of areas and careers. Whether you are pursuing a career in business or another discipline, Mission College's Business Department can help you build the skills necessary to succeed on the job.

The Business Department offers courses in wide range of topics as well as degree and certificate programs. Classes meet during the day, evening, online and on weekends. Many certificate programs can now be completed entirely through distance learning. Classes are offered on a rotating basis in a number of delivery formats.

Student Learning Outcomes:

Upon successful completion of the Business program, students will be able to:

- Describe the functions of American business;
- Choose a business career path;
- Transfer to colleges and universities;
- Successfully operate a business.

Career Options:

- Account Executive
- Analyst
- Bank Employee
- Buyer
- Data Entry Specialist
- Entrepreneur
- Financial Planner
- Government Service
- Insurance Rep
- Investment Counselor
- Manager
- Public Administration
- Purchasing Agent
- Real Estate
- Retail/Industrial Sales
- Stockbroker
- Tax Consultant

There are many self-employment opportunities available in these fields. Some career options require more than two years of college study.

Highlights:

- Additional training in courses acceptable as electives for civil services occupations.
- Hands-on experience in the use of computers for business purposes.
- Opportunities for work experience in local industry and business.
- Training for small business management/entrepreneurship.

Business Associate in Science

Business faculty recommend the A.S. degree program for the most comprehensive two year business education but Business Certificates are useful to students wishing to certify achieved competencies for occupational purposes. You will have greater success developing your majors and higher grade point averages if you delay more difficult advanced courses until you have learned the knowledge in basic foundation courses; BUS 51, Introduction to American Business, and BUS 64B, Business Math Using Calculators, are foundation courses that should be the first two courses in your college program to prepare you to achieve more difficult business courses such as economics and accounting with greater ease.

Dept. Core Courses (14 units required) Units

BUS 021	.....Introduction to Business Computing.....	3.0
BUS 021L	.....Introduction to Business Computing Laboratory...	1.0
BUS 028A	.....Business Law I	3.0
BUS 051	.....Introduction to American Business	3.0
BUS 064B	.....Business Math	4.0
Total Core Course Requirements:		14.0

Dept. Elective Core Courses (16 units) Units

BUS 010	.....Global Business.....	3.0
BUS 028B	.....Business Law II	3.0
BUS 050	.....Administrative Office Procedures	4.0
BUS 052	.....Fundamentals of Financial Investments.....	3.0