MINOR: Astronomy

The department offers an undergraduate astronomy minor degree, which requires 18 credits. The department does not offer a B.S. degree but encourages interested students to enroll in the physics program as a first step toward a career in astronomy. Our 100- and 300-level courses meet various university general education requirements. All students are invited to share with us this exciting area of study, through our basic and advanced undergraduate courses. The Department of Astronomy offers a graduate program leading to M.S. and Ph.D. degrees. Interested students should consult the Graduate School Catalog, which is available from the Graduate School.

Regular Undergraduate Course Offerings

ASTR 105G, The Planets....4
ASTR 110G, Introduction to Astronomy....4
ASTR 301G, Revolutionary Ideas in Science....3
ASTR 305G, Life in the Universe....3
ASTR 308G, Into the Final Frontier....3
ASTR 330G, Planetary Exploration....3
ASTR 405, Astronomy and Astrophysics I....3
ASTR 406, Astronomy and Astrophysics II....3
ASTR 435, Observational Techniques I....3

Other courses at the 300- and 400-levels are offered on an occasional basis. Consult the "Course Descriptions" chapter in this catalog.

MINOR: Astronomy

Pass one of ASTR 105G, The Planets; or ASTR 110G, Introduction to Astronomy....4
Pass two of: ASTR 301G, Revolutionary Ideas in Science, ASTR 305G, Life in the Universe, ASTR 308G, Into the Final Frontier, and/or ASTR 330G, Planetary Exploration....6
Note: ASTR 400 (Undergraduate Research) may replace one or both of the courses in this area
Pass one in each of the following: a) ASTR 405, Astronomy and Astrophysics I or ASTR 505, Astronomy and Astrophysics I....3
b) ASTR 406, Astronomy and Astrophysics II, or ASTR 506, Astronomy and Astrophysics II....3
c) ASTR 435, Observational Techniques I, or ASTR 535, Observational Techniques I....3

BIOLOGY

Professor Daniel Howard, department head

Professors Bernstein, Boecklen, Botsford, Gutschick, Howard, Milligan; ***Associate Professors*** Houde, Nishiguchi, Serrano, Smith; ***Assistant Professors*** Bailey, Curtis, Dawe, Gustafson, Hanley, Preszler, C. Shuster, Throop, Unguez, Wright; ***College Associate Professor*** Ghoshroy; ***College Assistant Professor*** M. Shuster
(505) 646-3611

DEGREE: Bachelor of Arts
MAJOR: Biology

DEGREE: Bachelor of Conservation Ecology
MAJOR: Conservation Ecology

DEGREE: Bachelor of Science
MAJOR: Biology
MAJOR: Microbiology

MINORS: Biology
Conservation Ecology
Human Biology
Microbiology

A student may earn the Bachelor of Arts in biology or the Bachelor of Science through major studies in the Department of Biology. The Bachelor of Science in biology or microbiology is recommended for premedical and predental students, those preparing to teach biology and other sciences at the secondary and college levels, those interested in the numerous fields of biological research and applied biology, and those planning on obtaining an advanced degree in biology.

Freshmen should begin taking required biology and chemistry courses in their first year. Students are required to speak with an adviser in the Department of Biology as soon as they declare a biology major. The department welcomes students considering a biology major who wish preliminary advising. More information on the Department of Biology is available on our web site, http:/biology-web.nmsu.edu

A student must earn a grade of C- or better to receive credit for any nondepartmental or departmental requirement for any major or minor offered by the Department of Biology.

It is strongly recommended that students include a minor or supplementary course work in a specific discipline to enhance their academic experience. See under General Information at the beginning of this catalog specific requirements for, and departments which offer, a minor. Selection of a minor or a supplementary course work area should be done in consultation with an adviser.

The department offers minors in biology and microbiology for students in other disciplines. In addition, we offer minors in human biology and in conservation ecology, for biology and other majors.

DEGREE: Bachelor of Arts
MAJOR: Biology

The Bachelor of Arts curriculum is intended for students who desire a broad education with emphasis in biology in a program chosen by the student in consultation with an adviser. The Bachelor of Arts is recommended for those who plan to teach biology at the primary and secondary school levels or to use a background in life science in business or other endeavors.

Nondepartmental Requirements

CHEM 111-112, General Chemistry I, II....8
CHEM 211, Organic Chemistry, or CHEM 313, 314, 315, Organic Chemistry, I, II and Lab....4-8
MATH 142G, Applied Mathematics for Biological and Social Sciences I, or MATH 191, Calculus and Analytic Geometry I....3
One course from one of the following departments: astronomy, computer science, geology or physics....3-4

Departmental Requirements

BIOL 111G, Natural History of Life....3
BIOL 111L, Natural History of Life Laboratory....1
BIOL 211G, Cellular and Organismal Biology....3
BIOL 211L, Cellular and Organismal Biology Laboratory....1
BIOL 305, Principles of Genetics....3
BIOL 467, Evolution....3
One course from each of the following four general areas:
Cellular integration: BIOL 311, 377, 474, 490
Organismal integration: BIOL 314, 354, 381, 442, 480
Ecology: BIOL 301, 473
Evolutionary pattern: BIOL 312, 313, 322, 330, 433, 439, 440, 445, 447, 465, 472

Sufficient upper-division biology electives to bring total upper-division credits to 20. Choice of electives should be done in consultation with an adviser.

Other electives: Sufficient to bring total to 128, including 54 upper-division.

DEGREE: Bachelor of Conservation Ecology
MAJOR: Conservation Ecology

See "Cross-College Degrees" section of this catalog.

DEGREE: Bachelor of Science
MAJOR: Biology

The major in biology provides a solid academic base for those planning to enter any of the various fields of the biological sciences. The program allows considerable latitude. Suggested course sequences for specific areas of interest within biology (such as botany, zoology, ecology, conservation biology, animal, plant, or cellular physiology, preprofessional studies, and preparation for graduate school) can be obtained from the student's adviser.

Nondepartmental Requirements

CHEM 111-112, General Chemistry I and II....8

CHEM 211, Organic Chemistry, or CHEM 313, 314, 315, Organic Chemistry, I, II and Lab 4-8
BCHE 341, Survey of Biochemistry, or BCHE 395, Biochemistry 3
E ST 311G, Statistical Applications 3
MATH 142G, Applied Mathematics for Biological and Social Sciences I, or MATH 191, Calculus and Analytic Geometry I 3
PHYS 211, General Physics I or PHYS 221, General Physics for Life Sciences I 3
PHYS 212, General Physics II, or PHYS 222, General Physics for Life Sciences II 3
PHYS 211L/212L, General Physics Laboratory 2

Departmental Requirements

BIOL 111G, Natural History of Life 3
BIOL 111L, Natural History of Life Laboratory 1
BIOL 211G, Cellular and Organismal Biology 3
BIOL 211L, Cellular and Organismal Biology Laboratory 1
BIOL 305, Principles of Genetics 3
BIOL 467, Evolution 3

One course from each of the four following general areas:

Cellular integration: BIOL 311, 377, 474, 490
Organismal integration: BIOL 314, 354, 381, 442, 480
Ecology: BIOL 301, 473
Evolutionary pattern: BIOL 312, 313, 322, 330, 433, 439, 440, 445, 447, 465, 472
Sufficient credits numbered 300 or above to bring total upper-division credits in the major to 22. At least one upper-division course must include laboratory and/or field experience. The laboratory/field requirement can be satisfied by any BIOL course above the 300 level that includes a laboratory or a field trip—including BIOL 350 or BIOL 450 3
Electives: Sufficient to bring the total credits to 128, including 54 upper-division.

MAJOR: Microbiology

The major in microbiology provides a solid academic base for those planning to enter any of the various fields of microbiology.

Nondepartmental Requirements

CHEM 111,112, General Chemistry I, II 8
CHEM 211, Organic Chemistry* 4
CHEM 371, Analytical Chemistry* 4
BCHE 341, Survey of Biochemistry or BCHE 395, Biochemistry 3
C S 110G, Computer Literacy 3
MATH 142G, Applied Mathematics for Biological and Social Sciences I, or MATH 191, Calculus and Analytic Geometry I 3
PHYS 211, General Physics I or PHYS 221, General Physics for Life Sciences I 3
PHYS 212, General Physics II, or PHYS 222, General Physics for Life Sciences II 3
PHYS 211L, 212L, General Physics Laboratory 2
*CHEM 313, 314, 315, Organic Chemistry I, II, and Lab (8 credits), may substitute for CHEM 211, CHEM 371.

Departmental Requirements

BIOL 111G, Natural History of Life 3
BIOL 111L, Natural History of Life Laboratory 1
BIOL 211G, Cellular and Organismal Biology 3
BIOL 211L, Cellular and Organismal Biology Laboratory 1
BIOL 311, General Microbiology 3
BIOL 311L, General Microbiology Laboratory 2
BIOL 305, Principles of Genetics 3
BIOL 451, Physiology of Microorganisms 3
BIOL 474, Immunology 3
BIOL 478, Molecular Biology of Microorganisms 3
BIOL 479, Medical Microbiology 3
BIOL 479L, Medical Microbiology Laboratory 1
Two additional credits related to microbiology numbered 300 or above to bring total upper-division credits in microbiology to 20. This course should be chosen in consultation with an adviser.
Electives: sufficient to bring total credits to 128 including 54 upper-division.

MINOR: Biology

A student cannot earn a bachelor's degree in Biology or Microbiology and also earn a minor in Biology.

18 credits in Biology, of which at least 9 credits must be numbered 300 and above. No more than 3 credits may be taken as special topics or individual study 18

MINOR: Conservation Ecology

A minor in Conservation Ecology is available for students who choose to major in other areas, but wish to include Conservation Ecology in their academic training. A minor in Conservation Ecology must include a minimum of 20 credits in the discipline with 9 of these coming from upper-division courses.

Core Curriculum (17 credits):
BIOL 111G, Natural History of Life 3
BIOL 111L, Natural History of Life, Lab 1
WLSC 230, Natural History of the Vertebrates 4
BIOL 301, Ecology 3
WLSC 447, Wildlife Law, Policy and Administration 3
BIOL 462, Conservation Biology; or WLSC 310, Managing Ecological Systems for Biodiversity 3
Conservation (3 credits): BIOL 488, Principles of Conservation Genetics; BIOL 467, Evolution; WLSC 409, Population Ecology; WLSC 445, Systems Ecology in Wildlife Science 3

MINOR: Microbiology

A student cannot earn a bachelor's degree in Biology or Microbiology and also earn a minor in Microbiology.

BCHE 341, Survey of Biochemistry, or BCHE 395, Biochemistry 3
BIOL 311, General Microbiology 3
BIOL 311L, General Microbiology Laboratory 2
At least 11 credits from among BIOL 412, Seminar in Microbiology, BIOL 451, Physiology of Microorganisms, BIOL 473, Ecology of Microorganisms, BIOL 474, Immunology, BIOL 475, Virology, BIOL 477, Applied and Environmental Microbiology, BIOL 478, Molecular Biology of Microorganisms, BIOL 479, Medical Mocrobiology, BIOL 479L, Medical Microbiology Laboratory, and/or BIOL 482, Microbial Systematics 11

CHEMISTRY and BIOCHEMISTRY

Professor Amudhu Gopalan, department head

Professors Arterburn, Eiceman, Gopalan, Herndon, M. Johnson, Kuehn, Lammers, Rayson ***Associate Professors*** Quintana, Smirnov, D. Smith, Zoski; ***Assistant Professors*** Lara, Lyons, J. Smith, H. Wang; ***Adjunct Professors*** J. Wang; ***College Professors*** Alexander, Des Enfants, Dunlavy, Ewing, D. Johnson, Mahmoud, Mueller, Potenza, Ytuarte

(505) 646-2505

DEGREE: Bachelor of Science
MAJOR: Chemistry
MAJOR: Biochemistry

DEGREE: Bachelor of Arts
MAJOR: Chemistry

MINORS: Biochemistry
Chemistry
Environmental Chemistry

A degree in chemistry or biochemistry enables a student to pursue a wide variety of careers: in research, production, sales, management, and teaching. These degrees are also an excellent preparation for professional studies in medicine, dentistry, forensics, veterinary science, optometry, pharmacology, pharmacy, and law.

Chemistry majors who have completed the requirements for the Bachelor of Science degree may receive American Chemical Society certification if they take one additional one-semester course which includes 1 credit of laboratory.

Students who complete a B.S. in Biochemistry and wish to complete the B.A. in Chemistry must complete 6 additional upper-divison chemistry credits that are not counted in the B.S. in Biochemistry.