



SACRAMENTO
STATE

Program Proposal Form B



Academic Group (College): Natural Sciences and Mathematics	Date of Submission to College Dean: 13 October 2008
Academic Organization (Department): Biological Sciences	Requested Effective: Fall <u>X</u> , Spring __, 2009.
Department Chair: Rose Leigh Vines	Contact if not Department Chair:

Title of the Program (Please be specific; indicate minor, undergraduate or graduate degree, etc.):
Bachelor of Arts in Biological Sciences; Bachelor of Science in Biological Sciences (All concentrations)

Type of Program Proposal:

- Modification in Existing Program:**
- Substantive Change
 - Non-Substantive Change
 - Deletion of Existing Program
- New Programs**
- Initiation (Projection) of New Program on to Master Plan
 - New Degree Programs
 - Regular Process
 - Fast Track Process
 - Pilot Process
 - New Minor, Concentration, Option, Specialization, Emphasis
 - New Certificate Program

PLEASE NOTE: Form B is to be used only as a Cover Form. Additional information is requested for each of the above as noted in the corresponding procedure in the Policies and Procedures for Initiation, Modification, Review and Approval of Courses and Academic Programs found at <http://www.csus.edu/umannual/acad.htm>

Briefly describe the program proposal (new or change) and provide a justification.
The Department of Biological Sciences is proposing the following change to the Bachelor of Arts and Bachelor of Science degree programs:

- Increase in Units for General Genetics (BIO 184) from 3-4 Units
- Decrease the elective Unit requirement within all concentrations by one unit

There is no net change in the units required for any degree program in the Biological sciences, making this a non-substantive change.

Justification: The Department of Biological Sciences is requesting a change in units for the General Genetics course (BIO 184) from 3 units to 4 units in order to increase the lecture time from 100 minutes to 150 minutes per week. This will allow instructors to thoroughly cover the principles of genetics which encompasses modern molecular genetics in addition to classic transmission genetics. These changes are consistent with comparable genetics courses taught within the CSU system (21 other campuses). This increase in units for BIO 184 results in an increased number of units for the Upper Division core for all degrees and concentrations in the Biological Sciences.

Approvals:

Department Chair: Rose Leigh Vines Date: 10/16/08

College Dean: Spencer Hefferman Date: 10/20/08

University Committee: _____ Date: _____

Associate Vice President and Dean
for Academic Affairs: _____ Date: _____

New Major Requirements

REQUIREMENTS · BACHELOR OF ARTS DEGREE

Units required for Major: 64-65 — OK

Minimum total units required for the BA: 120

Courses in parentheses are prerequisites.

A. Required Lower Division Core Courses (37-38 units)

- (5) BIO 001 Biodiversity, Evolution and Ecology
- (5) BIO 002 Cells, Molecules and Genes (BIO 001, CHEM 001A)
- (5) CHEM 001A General Chemistry I (High school algebra [two years] and high school chemistry; or equivalent)
- (5) CHEM 001B General Chemistry II (CHEM 001A)
- (3) CHEM 020 Organic Chemistry Lecture--Brief Course (CHEM 001B)
- (4) PHYS 005A General Physics: Mechanics, Heat, Sound (Recently completed three years of high school algebra and geometry; and a college course in algebra and trigonometry for those having an inadequate mathematics background)
- (4) PHYS 005B General Physics: Light, Electricity and Magnetism, Modern Physics (PHYS 005A or instructor permission)
- (3) STAT 001 Introduction to Statistics (MATH 009 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)

(3-4) Select one of the following:

- MATH 026A Calculus I for the Social and Life Sciences
(MATH 011 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)
- MATH 030 Calculus I (MATH 029 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)

Notes:

Pre-health professional students should take the Chemistry and Math requirements as stated in the Pre-health Professional Program section of this catalog. CHEM 024 and CHEM 124 may be taken in lieu of

Old Major Requirements

REQUIREMENTS · BACHELOR OF ARTS DEGREE

Units required for Major: 64-65

Minimum total units required for the BA: 120

Courses in parentheses are prerequisites.

A. Required Lower Division Core Courses (37-38 units)

- (5) BIO 001 Biodiversity, Evolution and Ecology
- (5) BIO 002 Cells, Molecules and Genes (BIO 001, CHEM 001A)
- (5) CHEM 001A General Chemistry I (High school algebra [two years] and high school chemistry; or equivalent)
- (5) CHEM 001B General Chemistry II (CHEM 001A)
- (3) CHEM 020 Organic Chemistry Lecture--Brief Course (CHEM 001B)
- (4) PHYS 005A General Physics: Mechanics, Heat, Sound (Recently completed three years of high school algebra and geometry; and a college course in algebra and trigonometry for those having an inadequate mathematics background)
- (4) PHYS 005B General Physics: Light, Electricity and Magnetism, Modern Physics (PHYS 005A or instructor permission)
- (3) STAT 001 Introduction to Statistics (MATH 009 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)

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- MATH 026A Calculus I for the Social and Life Sciences
(MATH 011 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)
- MATH 030 Calculus I (MATH 029 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)

Notes:

Pre-health professional students should take the Chemistry and Math requirements as stated in the Pre-health Professional Program section of this catalog. CHEM 024 and CHEM 124 may be taken in lieu of

CHEM 020. (CHEM 124 is not counted toward the 24 upper division unit requirement in the major.)

B. Required Upper Division Core Courses (17 units)

- (3) BIO 121 Cell Physiology (BIO 010, BIO 011, BIO 012, or both BIO 001 and BIO 002; CHEM 161)
- (4) BIO 139 General Microbiology (BIO 010 or BIO 020 or both BIO 001 and BIO 002; CHEM 006B, CHEM 020 or CHEM 024)
- (3) BIO 160 General Ecology (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO 002; STAT 001)
- (4) BIO 184 General Genetics (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO 002)
- (3) CHEM 161 General Biochemistry (CHEM 020 or CHEM 124)

Notes:

CHEM 161 is not counted toward the 24 upper division unit requirement in the major.

CHEM 160A and CHEM 160B may be taken in lieu of CHEM 161. Three units may be counted toward the 24 upper division unit requirement for the major.

C. Upper Division Electives (10 units)

Select ten (10) upper division biology units in consultation with an advisor. Upper division electives in biological sciences must include one course in plant biology and one course in animal biology.

Notes:

No more than 2 units from BIO 195, BIO 197, and BIO 199 combined can be applied to the Biological Sciences upper division major requirement.

BIO 106 and BIO 108 are not acceptable toward a BA in Biological Sciences.

With approval, up to six units of upper division coursework from related fields may be applied as electives in the major.

REQUIREMENTS - BACHELOR OF SCIENCE DEGREE

Units required for Major: 76-84, includes units of study in chosen concentration (see below)

Minimum total units required for the BS: 120-122
Courses in parentheses are prerequisites.

Note: Additional units may be required to meet the Sacramento State foreign language requirement.

A. Required Lower Division Core Courses (37-38 units)

- (5) BIO 001 Biodiversity, Evolution and Ecology
- (5) BIO 002 Cells, Molecules and Genes (BIO 001, CHEM 001A)
- (5) CHEM 001A General Chemistry I (High school algebra [two years] and high school chemistry; or equivalent)
- (5) CHEM General Chemistry II (CHEM 001A)

CHEM 020. (CHEM 124 is not counted toward the 24 upper division unit requirement in the major.)

B. Required Upper Division Core Courses (16 units)

- (3) BIO 121 Cell Physiology (BIO 010, BIO 011, BIO 012, or both BIO 001 and BIO 002; CHEM 161)
- (4) BIO 139 General Microbiology (BIO 010 or BIO 020 or both BIO 001 and BIO 002; CHEM 006B, CHEM 020 or CHEM 024)
- (3) BIO 160 General Ecology (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO 002; STAT 001)
- (3) BIO 184 General Genetics (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO 002; BIO 139)
- (3) CHEM 161 General Biochemistry (CHEM 020 or CHEM 124)

Notes:

CHEM 161 is not counted toward the 24 upper division unit requirement in the major.

CHEM 160A and CHEM 160B may be taken in lieu of CHEM 161. Three units may be counted toward the 24 upper division unit requirement for the major.

C. Upper Division Electives (11 units)

Select eleven (11) upper division biology units in consultation with an advisor. Upper division electives in biological sciences must include one course in plant biology and one course in animal biology.

Notes:

No more than 2 units from BIO 195, BIO 197, and BIO 199 combined can be applied to the Biological Sciences upper division major requirement.

BIO 106 and BIO 108 are not acceptable toward a BA in Biological Sciences.

With approval, up to six units of upper division coursework from related fields may be applied as electives in the major.

REQUIREMENTS - BACHELOR OF SCIENCE DEGREE

Units required for Major: 76-83, includes units of study in chosen concentration (see below)

Minimum total units required for the BS: 120-122
Courses in parentheses are prerequisites.

Note: Additional units may be required to meet the Sacramento State foreign language requirement.

A. Required Lower Division Core Courses (37-38 units)

- (5) BIO 001 Biodiversity, Evolution and Ecology
- (5) BIO 002 Cells, Molecules and Genes (BIO 001, CHEM 001A)
- (5) CHEM 001A General Chemistry I (High school algebra [two years] and high school chemistry; or equivalent)
- (5) CHEM General Chemistry II (CHEM 001A)

001B

- (3) CHEM 020 Organic Chemistry Lecture--Brief Course (CHEM 001B)
- (4) PHYS 005A General Physics: Mechanics, Heat, Sound
(Recently completed three years of high school algebra and geometry; and a college course in algebra and trigonometry for those having an inadequate mathematics background)
- (4) PHYS 005B General Physics: Light, Electricity and Magnetism, Modern Physics (PHYS 005A or instructor permission)
- (3) STAT 001 Introduction to Statistics (MATH 009 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)

(3-4) Select one of the following:

- MATH 026A Calculus I for the Social and Life Sciences (MATH 011 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)
- MATH 030 Calculus I (MATH 029 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)

Notes:

CHEM 024 and CHEM 124 may be taken in lieu of CHEM 020. (CHEM 124 is not counted toward the 36 upper division unit requirement in the major.)

Pre-health professional students should take the Chemistry and Math requirements as stated in the Pre-health Professional Program section of this catalog.

B. Required Upper Division Core Courses (17 units)

- (3) BIO 121 Cell Physiology (BIO 010, BIO 011, BIO 012, or both BIO 001 and BIO 002; CHEM 161)
- (4) BIO 139 General Microbiology (BIO 010 or BIO 020 or both BIO 001 and BIO 002; CHEM 006B, CHEM 020 or CHEM 024)
- (3) BIO 160 General Ecology (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO

001B

- (3) CHEM 020 Organic Chemistry Lecture--Brief Course (CHEM 001B)
- (4) PHYS 005A General Physics: Mechanics, Heat, Sound
(Recently completed three years of high school algebra and geometry; and a college course in algebra and trigonometry for those having an inadequate mathematics background)
- (4) PHYS 005B General Physics: Light, Electricity and Magnetism, Modern Physics (PHYS 005A or instructor permission)
- (3) STAT 001 Introduction to Statistics (MATH 009 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)

(3-4) Select one of the following:

- MATH 026A Calculus I for the Social and Life Sciences (MATH 011 or three years of high school mathematics which includes two years of algebra and one year of geometry; completion of ELM requirement and the Intermediate Algebra Diagnostic Test)
- MATH 030 Calculus I (MATH 029 or four years of high school mathematics which includes two years of algebra, one year of geometry, and one year of mathematical analysis; completion of ELM requirement and Pre-Calculus Diagnostic Test)

Notes:

CHEM 024 and CHEM 124 may be taken in lieu of CHEM 020. (CHEM 124 is not counted toward the 36 upper division unit requirement in the major.)

Prehealth professional students should take the Chemistry and Math requirements as stated in the Prehealth Professional Program section of this catalog.

B. Required Upper Division Core Courses (16 units)

- (3) BIO 121 Cell Physiology (BIO 010, BIO 011, BIO 012, or both BIO 001 and BIO 002; CHEM 161)
- (4) BIO 139 General Microbiology (BIO 010 or BIO 020 or both BIO 001 and BIO 002; CHEM 006B, CHEM 020 or CHEM 024)
- (3) BIO 160 General Ecology (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO

002; STAT 001). Not required in the Clinical Laboratory Technology concentration.

- (4) BIO 184 General Genetics (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO 002)
- (3) CHEM 161 General Biochemistry (CHEM 020 or CHEM 124)

Notes:

CHEM 161 is not counted toward the 36 upper division unit requirement in the major.

CHEM 160A and CHEM 160B may be taken in lieu of CHEM 161.

Three units may be counted toward the 36 upper division unit requirement for the major.

BIO 106 and BIO 108 are not acceptable toward a BS in Biological Sciences.

Additional Requirements for Concentrations

Units required: 22-29

No Concentration (22 units)

This degree program provides a broad background in biological sciences and the opportunity to select electives that meet individual needs and interests. The BS in Biological Sciences (with three supplemental geoscience courses) meets requirements leading to the Biology Subject Matter Competency Teaching Credential, satisfies requirements for admission to health professional schools, (with additional course work in Math and Chemistry), and provides necessary preparation for most graduate programs and selected entry level technical positions in industry and government. Requirements are one upper division course in plant biology and one upper division course in animal biology and enough additional upper division elective units to total 22. See "BA Major Requirements: C. Upper Division Electives."

Biological Conservation (22 units)

The curriculum in Biological Conservation is designed to prepare students for careers in the fields of fisheries and wildlife biology/management, conservation biology, natural resource conservation, environmental impact assessment and related areas. This curriculum meets the educational requirements for various entry level career positions with state and federal agencies. Students majoring in this concentration are urged to obtain on-the-job training with conservation agencies (such as California Department of Fish and Game) through summer or part-time employment, or through internships (BIO 195).

- (4) BIO 112 Plant Taxonomy (BIO 012 or both BIO 001 and BIO 002)
- (3) BIO 118 Natural Resource Conservation (BIO 011 and BIO 012 or both BIO 001 and BIO 002)
- (3) BIO Quantitative Methods in Biology (BIO

002; STAT 001). Not required in the Clinical Laboratory Technology concentration.

- (3) BIO 184 General Genetics (BIO 010, BIO 011 and BIO 012 or both BIO 001 and BIO 002; BIO 139)
- (3) CHEM 161 General Biochemistry (CHEM 020 or CHEM 124)

Notes:

CHEM 161 is not counted toward the 36 upper division unit requirement in the major.

CHEM 160A and CHEM 160B may be taken in lieu of CHEM 161.

Three units may be counted toward the 36 upper division unit requirement for the major.

BIO 106 and BIO 108 are not acceptable toward a BS in Biological Sciences.

Additional Requirements for Concentrations

Units required: 23-30

No Concentration (23 units)

This degree program provides a broad background in biological sciences and the opportunity to select electives that meet individual needs and interests. The BS in Biological Sciences (with three supplemental geoscience courses) meets requirements leading to the Biology Subject Matter Competency Teaching Credential, satisfies requirements for admission to health professional schools, (with additional course work in Math and Chemistry), and provides necessary preparation for most graduate programs and selected entry level technical positions in industry and government. Requirements are one upper division course in plant biology and one upper division course in animal biology and enough additional upper division elective units to total 23. See "BA Major Requirements: C. Upper Division Electives."

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- (4) BIO 112 Plant Taxonomy (BIO 012 or both BIO 001 and BIO 002)
- (3) BIO 118 Natural Resource Conservation (BIO 011 and BIO 012 or both BIO 001 and BIO 002)
- (3) BIO Quantitative Methods in Biology (BIO

- 167 011, BIO 012, STAT 001)
- (3) BIO Principles of Fisheries Biology (STAT
173 001, BIO 160)
- (3) BIO Principles of Wildlife Management
179 (BIO 160, BIO 166, BIO 168, or
instructor permission)

(6) Select six units from the following:

- BIO Field Botany (BIO 102, BIO 112 or
117 instructor permission)
- BIO General Entomology (BIO 011 or both
157 BIO 001 and BIO 002) OR
- BIO Aquatic Entomology (BIO 011 or both
172 BIO 001 and BIO 002)
- BIO Ichthyology: The Study of Fishes (BIO
162 011 or both BIO 001 and BIO 002)
- BIO Herpetology (BIO 011 or both BIO 001
164 and BIO 002; BIO 165)
- BIO Vertebrate Natural History (BIO 011 or
165 both BIO 001 and BIO 002)
- BIO Ornithology (BIO 011 or both BIO 001
166 and BIO 002)
- BIO Mammalogy (BIO 011 or both BIO 001
168 and BIO 002)
- BIO Animal Behavior (BIO 011 or both BIO
169 001 and BIO 002)
- BIO Ecological and Environmental Issues
186B Seminar (BIO 010, BIO 011 and BIO 012
or both BIO 001 and BIO 002)

Clinical Laboratory Science (29 units)

The curriculum in Clinical Laboratory Science meets the undergraduate course work requirements of the State of California for eligibility to take the Clinical Laboratory Scientist (CLS) Licensure Examination. Eligibility to take the licensure examination also requires a one year (CLS) internship training program at a state approved hospital laboratory. Completion of BS degree requirements in the Clinical Laboratory Science concentration does not guarantee admission to a CLS internship training program. Information on admission criteria and application procedures for the various CLS internship training programs throughout the state is available through the California Association for Medical Laboratory Technology (CAMLT) at their web site, www.camlt.org/cls/.

- (4) CHEM Quantitative Analysis (CHEM 001B)
031
- (3) CHEM General Biochemistry Laboratory
162 (CHEM 031; CHEM 160A or CHEM

- 167 011, BIO 012, STAT 001)
- (3) BIO Principles of Fisheries Biology (STAT
173 001, BIO 160)
- (3) BIO Principles of Wildlife Management
179 (BIO 160, BIO 166, BIO 168, or
instructor permission)

(7) Select seven units from the following:

- BIO Field Botany (BIO 102, BIO 112 or
117 instructor permission)
- BIO General Entomology (BIO 011 or both
157 BIO 001 and BIO 002) OR
- BIO Aquatic Entomology (BIO 011 or both
172 BIO 001 and BIO 002)
- BIO Ichthyology: The Study of Fishes (BIO
162 011 or both BIO 001 and BIO 002)
- BIO Herpetology (BIO 011 or both BIO 001
164 and BIO 002; BIO 165)
- BIO Vertebrate Natural History (BIO 011 or
165 both BIO 001 and BIO 002)
- BIO Ornithology (BIO 011 or both BIO 001
166 and BIO 002)
- BIO Mammalogy (BIO 011 or both BIO 001
168 and BIO 002)
- BIO Animal Behavior (BIO 011 or both BIO
169 001 and BIO 002)
- BIO Ecological and Environmental Issues
186B Seminar (BIO 010, BIO 011 and BIO 012
or both BIO 001 and BIO 002)

Clinical Laboratory Science (30 units)

The curriculum in Clinical Laboratory Science meets the undergraduate course work requirements of the State of California for eligibility to take the Clinical Laboratory Scientist (CLS) Licensure Examination. Eligibility to take the licensure examination also requires a one year (CLS) internship training program at a state approved hospital laboratory. Completion of BS degree requirements in the Clinical Laboratory Science concentration does not guarantee admission to a CLS internship training program. Information on admission criteria and application procedures for the various CLS internship training programs throughout the state is available through the California Association for Medical Laboratory Technology (CAMLT) at their web site, www.camlt.org/cls/.

- (4) CHEM Quantitative Analysis (CHEM 001B)
031
- (3) CHEM General Biochemistry Laboratory
162 (CHEM 031; CHEM 160A or CHEM