

BS IN BIOLOGICAL SCIENCE (MICROBIOLOGY)



SACRAMENTO STATE
Redefine the Possible

In Workflow

1. BIO Committee Chair (kneitel@csus.edu)
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3. NSM College Committee Chair (mikkel.jensen@csus.edu)
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8. Dean of Graduate (cnewsome@skymail.csus.edu)
9. Catalog Editor (catalog@csus.edu)
10. Registrar's Office (w lindsey@csus.edu)

Approval Path

1. Tue, 22 Feb 2022 19:37:52 GMT
Jamie Kneitel (kneitel): Approved for BIO Committee Chair
2. Tue, 22 Feb 2022 19:52:26 GMT
Jamie Kneitel (kneitel): Approved for BIO Chair
3. Fri, 04 Mar 2022 01:27:50 GMT
Mikkel Jensen (mikkel.jensen): Approved for NSM College Committee Chair
4. Fri, 04 Mar 2022 16:56:22 GMT
Shannon Datwyler (datwyler): Approved for NSM Dean

History

1. Apr 27, 2018 by clmig-jwehrheim
2. Aug 13, 2018 by 212408496
3. Aug 13, 2018 by 212408496
4. Aug 13, 2018 by 212408496
5. Oct 10, 2019 by Shannon Datwyler (datwyler)
6. Apr 28, 2020 by Celena Showers (celena.showers)
7. Apr 20, 2021 by Celena Showers (celena.showers)

Date Submitted: Tue, 22 Feb 2022 18:53:33 GMT

Viewing: BS in Biological Science (Microbiology)

Last approved: Tue, 20 Apr 2021 20:59:39 GMT

Last edit: Fri, 04 Mar 2022 01:27:30 GMT

Changes proposed by: Rob Crawford (215236945)

Academic Group: (College)

Natural Sciences & Mathematics

Academic Organization: (Department)

Biological Sciences

Catalog Year Effective:

2022-2023 Catalog

Individual(s) primarily responsible for drafting the proposed degree major program:

Name (First Last)	Email	Phone 999-999-9999
Rob Crawford	robert.crawford@csus.edu	916-278-6535

Type of Program Proposal:

Major

Program Change Type:

Non-Substantive

Title of the Program:

BS in Biological Science (Microbiology)

Designation: (degree terminology)

Bachelor of Science

Briefly describe the program proposal (new or change) and provide a justification:

The Department has voted to discontinue the pre-major.

Objectives of the degree program:

To provide students with the background and skills needed for careers in microbiological fields.

University Learning Goals**Undergraduate Learning Goals:**

Competence in the disciplines
 Integrative learning
 Intellectual and practical skills

Will this program be required as part of a teaching credential program, a single subject, or multiple subject waiver program (e.g., Liberal Studies, Biology) or other school personnel preparation program (e.g., School of Nursing)?

No

Do these changes impact the Smart Planner roadmap?

No

Catalog Description:**Units required for Major: 73-85, includes units of study in chosen concentration (see below).****Total units required for BS: 120****Program Description**

The concentration in Microbiology is designed to prepare students for entry level technical positions in the industry and graduate programs in Microbiology leading to careers in research and teaching. This curriculum meets the educational requirements for various entry level career positions for biotechnology, environmental, pharmaceutical, wastewater treatment, and agricultural areas of microbiology. Concentration includes a minor in Chemistry.

As defined by policy <http://www.csus.edu/umannual/acadaff/fsm00010.htm>, a change in units constitutes a substantive change to the program. If your changes constitute a substantive change, please refer back to the "Program Change Type" field above to ensure that "Substantive" is selected.

Program Requirements: (If new courses are being created as part of a new program, it will be useful to propose courses first.)**Program Requirements**

Code	Title	Units
Required Lower Division Core Courses (37-41 Units)		
BIO 1	Biodiversity, Evolution and Ecology ¹	5
BIO 2	Cells, Molecules and Genes	5
CHEM 1A	General Chemistry I ¹	5
CHEM 1B	General Chemistry II	5
Select one of the following:		3 - 6
CHEM 20	Organic Chemistry Lecture–Brief Course ²	

CHEM 24 & CHEM 124	Organic Chemistry Lecture I Organic Chemistry Lecture II	
Select one of the following:		3 - 4
MATH 26A	Calculus I for the Social and Life Sciences	
MATH 30	Calculus I	
PHYS 5A	General Physics: Mechanics, Heat, Sound	4
PHYS 5B	General Physics: Light, Electricity and Magnetism, Modern Physics	4
STAT 1	Introduction to Statistics ¹	3
Required Upper Division Core Courses (7 Units)		
BIO 100	Introduction to Scientific Analysis	3
BIO 184	General Genetics	4
Concentration (29-37 Units)		
Select from the following concentrations:		29 - 37
General Biology		
Biomedical Sciences		
Cell and Molecular Biology		
Clinical Laboratory Sciences		
Ecology, Evolution, and Conservation		
Forensic Biology		
Microbiology		
Total Units		73-85

¹ Course also satisfies General Education (GE)/Graduation Requirement.

² CHEM 24 and CHEM 124 may be taken in lieu of CHEM 20. (CHEM 124 is not counted toward the 36 upper division unit requirement in the major except in the Biomedical Sciences Concentration.)

Notes:

- Pre-Health Professional students should take the Chemistry and Math requirements as stated in the Pre-Health Professional Program section of this catalog.
- With approval, up to six units of upper division coursework from related fields may be applied as electives in the major.

Concentration in Microbiology (34-36 units)

Code	Title	Units
Required Courses (29-31 Units)		
BIO 121	Molecular Cell Biology	3
BIO 139	General Microbiology	4
BIO 143	General Virology	3
BIO 145	The Diversity of Microorganisms	4
BIO 180	Advanced Molecular Biology	4
CHEM 20L or CHEM 25	Introductory Organic Chemistry Laboratory Organic Chemistry Laboratory	1 - 3
CHEM 31	Quantitative Analysis	4
CHEM 161	General Biochemistry ¹	3
CHEM 162	General Biochemistry Laboratory ²	3

Elective Courses (5 Units)

Select 5 units from the following Cell and Molecular Biology electives or Clinical Laboratory Science and Infectious Disease electives: ³ 5

Cell and Molecular Biology Electives

BIO 149A	Immunology	
BIO 150	Forensic Biology	
BIO 151	Advanced Laboratory Techniques in Forensic Biology	
BIO 178	Molecular Ecology	
BIO 170	Advanced Nutrition and Metabolism	
BIO 183	Cancer Biology	
BIO 185	Topics in Biology	
BIO 186A	Cell and Molecular Biology Seminar	
BIO 187	Advanced Cell Biology	

Clinical Laboratory Science and Infectious Disease Electives

BIO 134	Medical Mycology
BIO 140	Medical Microbiology and Emerging Infectious Diseases ⁴
BIO 144	Pathogenic Bacteriology ⁴
BIO 149B	Immunology and Serology Laboratory
BIO 152	Human Parasitology
PUBH 148	Epidemiology

Total Units **34-36**

- ¹ CHEM 160A and CHEM 160B may be taken in lieu of CHEM 161. Only three units of the package may be counted toward the upper division requirement.
- ² CHEM 162 can be included in the 36 upper division unit requirement for this concentration.
- ³ Electives chosen in consultation with an advisor. BIO 124 and BIO 125 cannot be taken to fulfill the elective requirements for the Microbiology Concentration.
- ⁴ Students may not receive credit for both BIO 140 and BIO 144. Cannot be counted for credit in the Clinical Laboratory Sciences concentration.
- ⁵ Required for Public Health Microbiology Traineeship.

Code	Title	Units
BIO 195	Biological Internship	1 - 2
BIO 197A	Laboratory Teaching Assistant	1 - 2
BIO 197B	Laboratory Techniques	1 - 2
BIO 197C	Co-curricular Activities in Biology	1 - 2
BIO 199A	Introductory Undergraduate Research	1 - 2
BIO 199B	Directed Readings	1 - 2

- No more than 3 units from the following combined can be applied to the Biological Sciences upper division major requirement. No more than 2 units of BIO 195 and 197 series courses can count toward the major requirement.

General Education Requirements ¹

Code	Title	Units
Area A: Basic Subjects (9 Units)		
A1	Oral Communication	3
A2	Written Communication	3
A3	Critical Thinking	3
Area B: Physical Universe and Its Life Forms (3 Units)		
B1	Physical Science ²	0
B2	Life Forms ²	0
B3	Lab (Note: Lab experience to be taken with one of the following: B1, B2 or B5) ²	0
B4	Math Concepts ²	0
B5	Additional Course (Any B to reach 12 units) - Take upper-division course to complete Area & upper division requirements.	3
Area C: Arts and Humanities (12 Units)		
C1	Arts	3
C2	Humanities	3
C1/C2	Area C Course	3
C1/C2	Area C Course - Take upper-division course to complete Area & upper division requirements.	3
Area D: The Individual and Society (9 Units)		
Area D	Course	3
Area D	Course	3
Area D	Course - Take upper-division course to complete Area & upper division requirements.	3
Area E: Understanding Personal Development (3 Units)		
Area E	Course	3
Area F: Ethnic Studies (3 Units)		
Area F	Course	3
Total Units		39

- ¹ To help you complete your degree in a timely manner and not take more units than absolutely necessary, there are ways to use single courses to meet more than one requirement (overlap). For further information, please visit the General Education page (<http://catalog.csus.edu/colleges/academic-affairs/general-education/>).
Note: There is no way to list all possible overlaps so please consult with a professional advisor. The Academic Advising Center can be visited online (<http://www.csus.edu/acad/>), by phone (916) 278-1000, or email (advising@csus.edu).
- ² Required in Major; also satisfies GE.

Graduation Requirements ¹

Code	Title	Units
Graduation Requirements (required by CSU) (9 Units)		
	American Institutions: U.S. History	3
	American Institutions: U.S. Constitution & CA Government	3
	Writing Intensive (WI)	3
Graduation Requirements (required by Sacramento State) (12 Units)		
	English Composition II	3
	Race and Ethnicity in American Society (RE)	3
	Foreign Language Proficiency Requirement ²	6

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² If not satisfied before entering Sacramento State, it may be satisfied in General Education Area C2 (Humanities). "C- or better required." The alternative methods for satisfying the Foreign Language Proficiency Requirement are described here: <https://www.csus.edu/college/arts-letters/world-languages-literatures/foreign-language-requirement.html> (<https://www.csus.edu/college/arts-letters/world-languages-literatures/foreign-language-requirement.html>)

Fiscal Impact to Change an Existing Program

Indicate programmatic or fiscal impact which this change will have on other academic units' programs, and describe the consultation that has occurred with affected units:

None, this just eliminates the pre-major designation. All courses stay the same.

Provide a fiscal analysis of the proposed changes:

None.

How will the above changes be accommodated within the department/College existing fiscal resources?

None.

Will the proposed changes require additional resources?

No

What additional space, equipment, operating expenses, library, computer, or media resources, clerical/technical support, or other resources will be needed?

None.

Key: 292