



**SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS**

Substantive Program Modification Form

UNIVERSITY:	SDSU
CURRENT PROGRAM DEGREE:	Bachelor of Science (B.S.)
CURRENT PROGRAM MAJOR/MINOR:	Biochemistry
CURRENT SPECIALIZATION	N/A
CIP CODE:	26.0202
UNIVERSITY DEPARTMENT:	Chemistry & Biochemistry
BANNER DEPARTMENT CODE:	SCHB
UNIVERSITY COLLEGE:	Natural Science
BANNER COLLEGE CODE:	3T

University Approval

To the Board of Regents and the Executive Director: I certify that I have read this proposal, that I believe it to be accurate, and that it has been evaluated and approved as provided by university policy.

Dennis D. Hedge

Vice President of Academic Affairs or
President of the University

4/28/2023

Date

1. This modification addresses a change in:

- | | |
|--|---|
| <input checked="" type="checkbox"/> Total credits required within the discipline | <input checked="" type="checkbox"/> Total credits of supportive course work |
| <input type="checkbox"/> Total credits of elective course work | <input type="checkbox"/> Total credits required for program |
| <input type="checkbox"/> Program name | <input type="checkbox"/> Existing specialization |
| <input type="checkbox"/> CIP Code | <input type="checkbox"/> Other (explain below) |

2. Effective date of change: 2023-2024 Academic Year

3. Program Degree Level: Associate ☐ Bachelor's ☒ Master's ☐ Doctoral ☐

4. Category: Certificate ☐ Specialization ☐ Minor ☐ Major ☒

5. If a name change is proposed, the change will occur:

- ☐ On the effective date for all students
- ☐ On the effective date for students new to the program (enrolled students will graduate from existing program)
- Proposed new name:

6. Is the program being modified associated with a current articulation agreement? Yes ☐ No ☒

- a. If yes, will the articulation agreement need to be updated with the partner institution following the approve of the program change? Please explain: N/A

7. Primary Aspects of the Modification:

Existing Curriculum

Proposed Curriculum (*highlight changes*)

Pref.	Num.	Title	Cr. Hrs.	Pref.	Num.	Title	Cr. Hrs.
Systems General Education Requirements			33	Systems General Education Requirements			25
Systems General Education Requirements – Electives			12	Systems General Education Requirements – Electives			21
						SGR #1	3
						SGR #1	3
						SGR #2	3
		SGR #3	3			SGR #3	3
		SGR #3	3			SGR #3	3
		SGR #4	3			SGR #4	3
		SGR #4	3			SGR #4	3
Systems General Education Requirements – Required			21	Systems General Education Requirements – Required			4
ENGL	101	Composition I (SGR #1)	3	ENGL	101	Composition I (SGR #1)	3
ENGL	201	Composition II (3) (SGR #1)	3	ENGL	201	Composition II (3) (SGR #1)	3
CMST	101	Fundamentals of Speech (SGR #2)	3	CMST	101	Fundamentals of Speech (SGR #2)	3
MATH	123	Calculus (SGR #5)	4	MATH	123	Calculus (SGR #5)	4
CHEM	112	General Chemistry I (SGR #6)	3	CHEM	112	General Chemistry I (SGR #6) (Major Requirement) (3)	--
CHEM	112L	General Chemistry I Lab (SGR #6)	1	CHEM	112L	General Chemistry I Lab (SGR #6) (Major Requirement) (3)	--
CHEM	114	General Chemistry II (SGR #6)	3	CHEM	114	General Chemistry II (SGR #6) (Major Requirement) (1)	--
CHEM	114L	General Chemistry II Lab (SGR #6)	1	CHEM	114L	General Chemistry II Lab (SGR #6) (Major Requirement) (1)	--
Department Requirements <i>Additional required credits of coursework beyond SGRs, Major, and Support Courses</i>			3	Department Requirements <i>Additional required credits of coursework beyond SGRs, Major, and Support Courses</i>			1
		Natural Sciences (10+) Satisfying coursework must include - at least two classes with laboratory components - at least two different prefixes (MATH and STATS courses do not count toward the Science requirement.) (6 credits of SGR #6 are counted toward this goal and 4 credits of major coursework)	0			Natural Sciences (10+) Satisfying coursework must include - at least two classes with laboratory components - at least two different prefixes (MATH and STATS courses do not count toward the Science requirement.) (6 credits of SGR #6 are counted toward this goal and 4 credits of major coursework)	0
AHSS	111	Introduction to Global Citizenship and Diversity	3	AHSS	111	Introduction to Global Citizenship and Diversity	3
		One declared minor outside of the major prefix OR a second major OR a teaching specialization. The minor may be a traditional minor within one department or it may be interdisciplinary involving more than one department. The minor can be in a different college. The minor must be declared no later than the student's third semester of enrollment.	-			One declared minor outside of the major prefix OR a second major OR a teaching specialization. The minor may be a traditional minor within one department or it may be interdisciplinary involving more than one department. The minor can be in a different college. The minor must be declared no later than the student's third semester of enrollment.	-
		Capstone course within major CHEM 498 Undergraduate Research/Scholarship	--			Capstone course within major CHEM 498 Undergraduate Research/Scholarship	--
		33 Upper Division Credits (300-400 level coursework inside and outside of the major)	--			33 Upper Division Credits (300-400 level coursework inside and outside of the major)	--
Major Requirements			44	Major Requirements			53
Major Core			26	Major Core			35

Existing Curriculum

Proposed Curriculum (highlight changes)

Pref.	Num.	Title	Cr. Hrs.	Pref.	Num.	Title	Cr. Hrs.
				CHEM	112	General Chemistry I (SGR #6)	3
				CHEM	112L	General Chemistry I Lab (SGR #6)	1
				CHEM	114	General Chemistry II (SGR #6)	3
				CHEM	114L	General Chemistry II Lab (SGR #6)	1
CHEM	119	First Year Seminar	1	CHEM	119	First Year Seminar	1
				CHEM	180	Introduction to Laboratory Safety	1
CHEM	237	Introduction to Research	1	CHEM	237	Introduction to Research	1
CHEM	326	Organic Chemistry I	3	CHEM	326	Organic Chemistry I	3
CHEM	326L	Organic Chemistry I Lab	1	CHEM	326L	Organic Chemistry I Lab	1
CHEM	328	Organic Chemistry II	3	CHEM	328	Organic Chemistry II	3
CHEM	328L	Organic Chemistry II Lab	1	CHEM	328L	Organic Chemistry II Lab	1
CHEM	448	Biophysical Chemistry	3	CHEM	448	Biophysical Chemistry	3
CHEM	448L	Biophysical Chemistry & Lab	1	CHEM	448L	Biophysical Chemistry & Lab	1
CHEM	464	Biochemistry I	3	CHEM	464	Biochemistry I	3
CHEM	465	Biochemistry II	3	CHEM	465	Biochemistry II	3
CHEM	466	Laboratory Methods in Biochemistry	1	CHEM	466	Laboratory Methods in Biochemistry	1
CHEM	490	Seminar	1	CHEM	490	Seminar	1
CHEM	498	Undergraduate Research, must be taken over a minimum of two semesters. (Research Experience in Biochemistry)	4	CHEM	498	Undergraduate Research, must be taken over a minimum of two semesters. (Research Experience in Biochemistry)	4
Advanced Chemistry Electives			9	Advanced Chemistry Electives			9
CHEM	329	Intermediate Organic Chemistry	2	CHEM	329	Intermediate Organic Chemistry	2
CHEM	329L	Intermediate Organic Chemistry Lab	2	CHEM	329L	Intermediate Organic Chemistry Lab	2
CHEM	332	Analytical Chemistry I	3	CHEM	332	Analytical Chemistry I	3
CHEM	332L	Analytical Chemistry I Lab	1	CHEM	332L	Analytical Chemistry I Lab	1
				CHEM	345	Quantum Mechanics of Chemical Systems	2
CHEM	432	Analytical Chemistry II	2	CHEM	432	Analytical Chemistry II	2
CHEM	433	Bioanalytical Chemistry	3	CHEM	433	Bioanalytical Chemistry	3
CHEM	452	Inorganic Chemistry	3	CHEM	452	Inorganic Chemistry	3
CHEM	452L	Inorganic Chemistry	1	CHEM	452L	Inorganic Chemistry	1
CHEM	467	Essentials of Glycobiology (can be used for upper division chemistry elective OR upper division biology elective, but not both)	3	CHEM	467	Essentials of Glycobiology (can be used for upper division chemistry elective OR upper division biology elective, but not both)	3
				CHEM	468	Chemical Biology (can be used for upper division chemistry elective OR upper division biology elective, but not both)	3
CHEM	482	Environmental Chemistry	3	CHEM	482	Environmental Chemistry	3
CHEM	484	Chemical Toxicology	3	CHEM	484	Chemical Toxicology	3
Upper Division Biology Electives			9	Upper Division Biology Electives			9
BIOL	325	Physiology	4	BIOL	325	Physiology	4
BIOL	325L	Physiology Lab	0	BIOL	325L	Physiology Lab	0
BIOL	371	Genetics	3	BIOL	371	Genetics	3
BIOL	373	Evolution	3	BIOL	373	Evolution	3
BIOL	383	Bioethics	4	BIOL	383	Bioethics	4
BIOL	466	Environmental Toxicology and Contaminants	3	BIOL	466	Environmental Toxicology and Contaminants	3
BIOL	470	Cancer Biology	3	BIOL	470	Cancer Biology	3
BIOL	483	Developmental Biology	3	BIOL	483	Developmental Biology	3
BOT	327	Plant Physiology	4	BOT	327	Plant Physiology	3
BOT	327L	Plant Physiology Lab	0	BOT	327L	Plant Physiology Lab	1

Existing Curriculum				Proposed Curriculum (<i>highlight changes</i>)			
Pref.	Num.	Title	Cr. Hrs.	Pref.	Num.	Title	Cr. Hrs.
CHEM	467	Essentials of Glycobiology (can be used for upper division biology elective or upper division chemistry elective, but not both)	3	CHEM	467	Essentials of Glycobiology (can be used for upper division biology elective or upper division chemistry elective, but not both)	3
MICR OR MICR	231-231L	General Microbiology & Lab (4)	4	MICR OR MICR	231-231L	General Microbiology & Lab (4)	4
	233-233L	Introductory Microbiology & Lab (4)		233-233L	Introductory Microbiology & Lab (3,1)		
MICR	332	Microbial Physiology	2	MICR	332	Microbial Physiology	2
MICR	332L	Microbial Physiology Lab	2	MICR	332L	Microbial Physiology Lab	2
MICR	424	Medical Veterinary Virology	3	MICR	424	Medical Veterinary Virology	3
MICR	438L	Techniques in Molecular Biology Lab	2	MICR	438L	Techniques in Molecular Biology Lab	2
MICR	439	Medical and Veterinary Immunology	3	MICR	439	Medical and Veterinary Immunology	3
MICR	448	Molecular and Microbial Genetics	4	MICR	448	Molecular and Microbial Genetics	4
MICR	450	Applied Microbiology and Biotechnology	3	MICR	450	Applied Microbiology and Biotechnology	3
				CHEM	468	Chemical Biology (can be used for upper division chemistry elective OR upper division biology elective, but not both)	3
STAT	435	Applied Bioinformatics	3	STAT	435	Applied Bioinformatics	3
Supporting Coursework			15	Supporting Coursework			17
MATH	125	Calculus II	4	MATH	125	Calculus II	4
PHYS	211	University Physics I	4	PHYS	211	University Physics I	4
PHYS	211L	University Physics I Lab	0	PHYS	211L	University Physics I Lab	1
PHYS	213	University Physics II	4	PHYS	213	University Physics II	4
PHYS	213L	University Physics II Lab	0	PHYS	213L	University Physics II Lab	1
STAT	381	Introduction to Probability and Statistics	3	STAT	381	Introduction to Probability and Statistics	3
Electives (Taken as needed to complete any additional degree requirements)			25	Electives (Taken as needed to complete any additional degree requirements)			25
Summary of Credits Biochemistry (B.S.)							
System General Education Requirements			33	System General Education Requirements			25
Department Requirements <i>Additional required credits of coursework beyond SGRs, Major, and Support Courses</i>			3	Department Requirements <i>Additional required credits of coursework beyond SGRs, Major, and Support Courses</i>			0
Majors Requirements			44	Majors Requirements			53
Supporting Courses			15	Supporting Courses			17
Electives (Taken as needed to complete any additional degree requirements)			25	Electives (Taken as needed to complete any additional degree requirements)			25
Total number of hours required for major			83	Total number of hours required for major			74
Total number of hours required for degree			120	Total number of hours required for degree			120

8. Explanation of the Change:

The Department of Chemistry and Biochemistry has identified the following changes to the Biochemistry major:

- Removed a specific course selection from SGR #1 and SGR #2 to allow students more flexibility in meeting their System General Education requirements.
- Dropped AHSS 111 Introduction to Global Citizenship and Diversity and minor requirements to more directly focus the major.
- Added CHEM 180 Introduction to Laboratory Safety (1 cr.) to better prepare students for laboratory experiences. Safety is of prime consideration in the chemistry laboratory. Recent serious accidents in academic research laboratories nationwide have renewed the emphasis on creating a culture of safety. This course will be required of departmental majors in their first

semester in order to instill safety principles at the onset of their education, shifting part of the burden of safety education from individual research laboratories students typically engage during their junior and senior years.

- Added CHEM 345 Quantum Mechanics of Chemical Systems (2 cr.) and CHEM 468 Chemical Biology (3 cr.) as chemistry electives to provide students increased flexibility reflective of recent developments in the discipline. CHEM 468 Chemical Biology is also allowed as a biology elective, reflecting the interdisciplinary nature of the course.
- Updated zero credit lab courses. Departments made change to zero credit lab courses to accurately reflect contact time. PHYS 211-211L University Physics I & Lab and PHYS 213-213L University Physics I & Lab increased from 4+0 to 4+1 credit courses.
- Removed the department requirement to complete 10+ credits of Natural Science coursework. This language is redundant to current program requirements. The requirement was carried over when the department transitioned from the College of Arts and Sciences to the College of Natural Sciences.