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:	**Chemistry**
CURRENT SPECIALIZATION	**N/A**
CIP CODE:	**40.0501**
UNIVERSITY DEPARTMENT:	**Chemistry, Biochemistry and Physics**
BANNER DEPARTMENT CODE:	**SCBP**
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

4/24/2024
Date

1. **This modification addresses a change in:**
   - ☐ Total credits required within the discipline
   - ☐ Total credits of elective course work
   - ☒ Program name
   - ☐ CIP Code
   - ☐ Modification requiring Board of Regents approval
     Must have prior approval from Executive Director or designee
   - ☐ Total credits of supportive course work
   - ☐ Total credits required for program
   - ☐ Existing specialization
   - ☒ Other: Revised Coursework
2. **Effective date of change:** 2024-2025 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: Chemistry - ACS Certified
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			**25**	**Systems General Education Requirements**			**25**
Systems General Education Requirements – Electives			**21**	**Systems General Education Requirements – Electives**			**21**
		SGR #1	3			SGR #1	3
		SGR #1	3			SGR #1	3
		SGR #2	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			**4**	**Systems General Education Requirements – Required**			**4**
MATH	123	Calculus (SGR #5)	4	MATH	123	Calculus (SGR #5)	4
CHEM	112	General Chemistry I (SGR #6) (Major Requirement) (3)	--	CHEM	112	General Chemistry I (SGR #6) (Major Requirement) (3)	--
CHEM	112L	General Chemistry I Lab (SGR #6) (Major Requirement) (3)	--	CHEM	112L	General Chemistry I Lab (SGR #6) (Major Requirement) (3)	--
CHEM	114	General Chemistry II (SGR #6) (Major Requirement) (1)	--	CHEM	114	General Chemistry II (SGR #6) (Major Requirement) (1)	--
CHEM	114L	General Chemistry II Lab (SGR #6) (Major Requirement) (1)	--	CHEM	114L	General Chemistry II Lab (SGR #6) (Major Requirement) (1)	--
Department Requirements *Additional required credits of coursework beyond SGRs, Major, and Support Courses*			**0**	**Department Requirements** *Additional required credits of coursework beyond SGRs, Major, and Support Courses*			**0**
		Capstone course within major CHEM 498 Undergraduate Research/Scholarship	--			Capstone course within major CHEM 498 Undergraduate Research/Schoalrship	--
		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			**48**	**Major Requirements**			**48**
Major Core			39	Major Core			39
CHEM	112	General Chemistry I (SGR #6)	3	CHEM	112	General Chemistry I (SGR #6)	3
CHEM	112L	General Chemistry I Lab (SGR #6)	1	CHEM	112L	General Chemistry I Lab (SGR #6)	1
CHEM	114	General Chemistry II (SGR #6)	3	CHEM	114	General Chemistry II (SGR #6)	3
CHEM	114L	General Chemistry II Lab (SGR #6)	1	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	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	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	343	Fundamentals of Thermodynamics	2	CHEM	343	Fundamentals of Thermodynamics	2
CHEM	343L	Fundamentals of Thermodynamics Lab	1	CHEM	343L	Fundamentals of Thermodynamics Lab	1
CHEM	452	Inorganic Chemistry	3	CHEM	452	Inorganic Chemistry	3
CHEM	452L	Inorganic Chemistry Lab	1	CHEM	452L	Inorganic Chemistry Lab	1
CHEM	464	Biochemistry I	3	CHEM	464	Biochemistry I	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)	4	CHEM	498	Undergraduate Research, must be taken over a minimum of two semesters. (Research Experience)	4
Chemistry Electives			9	Chemistry Electives			9
CHEM	329	Intermediate Organic Chemistry	2	CHEM	329	Intermediate Organic Chemistry	2
CHEM	329L	Intermediate Organic Chemistry Laboratory	2	CHEM	329L	Intermediate Organic Chemistry Laboratory	2

Existing Curriculum				*Proposed Curriculum (highlight changes)*			
Pref.	**Num.**	**Title**	**Cr. Hrs.**	**Pref.**	**Num.**	**Title**	**Cr. Hrs.**
CHEM	345	Quantum Mechanics of Chemical Systems	2	CHEM	345	Quantum Mechanics of Chemical Systems	2
CHEM	347	Chemical Kinetics	2	CHEM	347	Chemical Kinetics	2
CHEM	432	Analytical Chemistry II	2	CHEM	432	Analytical Chemistry II	2
CHEM	433	Bioanalytical Chemistry	3	CHEM	433	Bioanalytical Chemistry	3
CHEM	448	Biophysical Chemistry	3	CHEM	448	Biophysical Chemistry	3
CHEM	448L	Biophysical Chemistry & Lab	1	CHEM	448L	Biophysical Chemistry & Lab	1
CHEM	465	Biochemistry II	3	CHEM	465	Biochemistry II	3
CHEM	467	Essentials of Glycobiology	3	CHEM	467	Essentials of Glycobiology	3
CHEM	468	Chemical Biology	3	CHEM	468	Chemical Biology	3
CHEM	482	Environmental Chemistry	3	CHEM	482	Environmental Chemistry	3
CHEM	484	Chemical Toxicology	3	CHEM	484	Chemical Toxicology	3
				PHYS	331	Introduction to Modern Physics	3
				PHYS	341	Thermodynamics	2
				PHYS	437	Foundations of Health Physics	3
Supporting Coursework			**18**	**Supporting Coursework**			**18**
MATH	125	Calculus II	4	MATH	125	Calculus II	4
MATH	225	Calculus III	4	MATH	225	Calculus III	4
PHYS	211	University Physics I	4	PHYS	211	University Physics I	4
PHYS	211L	University Physics I Lab	1	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	1	PHYS	213L	University Physics II Lab	1
Electives *(Taken as needed to complete any additional degree requirements)*			**29**	**Electives** *(Taken as needed to complete any additional degree requirements)*			**29**

Summary of Credits Chemistry - ACS Certified (B.S.)			
System General Education Requirements	**25**	**System General Education Requirements**	**25**
Department Requirements *Additional required credits of coursework beyond SGRs, Major, and Support Courses*	**9**	**Department Requirements** *Additional required credits of coursework beyond SGRs, Major, and Support Courses*	**0**
Majors Requirements	**48**	**Majors Requirements**	**48**
Supporting Coursework	**18**	**Supporting Coursework**	**18**
Electives *(Taken as needed to complete any additional degree requirements)*	**29**	**Electives** *(Taken as needed to complete any additional degree requirements)*	**29**
Total number of hours required for major	70	Total number of hours required for major	70
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, Biochemistry and Physics has added PHYS 437 Foundations of Health Physics (3 cr.), PHYS 341 Thermodynamics (2 cr.) and PHYS 331 Introduction to Modern Physics (3 cr.) as chemistry elective courses. This will provide students increased flexibility reflective of recent developments in the discipline. It also increases the availability of electives in the area of physical chemistry, recognizing the interdisciplinarity nature of science (physics and chemistry), and the new department formed by merging physics, chemistry and biochemistry. PHYS 437 Foundations of Health Physics may be of special interest to chemistry students interested in pursuing medical school as it can provide a foundation in applications related to nuclear medicine and radiochemistry.

The department has also requested to change the name of the major from *Chemistry* to *Chemistry - ACS Certified*. Inclusion of ACS certification in the program name is common within the chemistry discipline to distinguish programs and program pathways that meet the requirements of the American Chemical Society. Employers find overall that graduates possessing ACS Certified degrees are better prepared for employment. Graduate schools also look more favorably on applicants with this type of chemistry degree. Because of the discipline standard of including

ACS certification in the program name, employers and graduate schools may not utilize other methods of verifying ACS certification. Therefore, the ability of an employer or graduate school to easily confirm ACS certification of the degree directly from a student's official transcript allows them to have confidence in the student's training and sets the Chemistry – ACS Certified degree holders from SDSU apart from graduates of other institutions with just "Chemistry" listed on their transcripts. Examples of universities that include ACS Certified as part of the program title include Marshall University [Chemistry (ACS Certified) (BS)] and Weber State University [Chemistry - ACS Certified (BS)].

The guidelines for a certified bachelor's degree were developed specifically to prepare students for success in a broad array of careers. Independent of whether a student intends to move into an industrial position, pursue graduate study in a chemical field, or enter into another professional career track that requires rigorous scientific training, they will benefit from being able to build on a strong background including chemical knowledge, laboratory competency and safe laboratory practices, oral and written communication skills, familiarity with the chemical literature, and experience with working both independently and as part of a team. Specific delineation that the SDSU Chemistry degree is ACS certified will show clearly on a student's transcript that they have this extra level of rigor associated with the degree.