

SOUTH DAKOTA BOARD OF REGENTS

Academic and Student Affairs
Consent

AGENDA ITEM: 5 – B (1)
DATE: March 29-30, 2023

SUBJECT

New Program Request – SDSU – Minor in Pharmacology and Toxicology

CONTROLLING STATUTE, RULE, OR POLICY

[BOR Policy 2:23](#) – New Programs, Program Modifications, Curricular Requests, and Inactivation/Termination

BACKGROUND / DISCUSSION

South Dakota State University (SDSU) requests authorization to offer a minor in Pharmacology and Toxicology. The proposed minor will enable students to explore fundamental and advanced concepts in pharmacology (the study of how chemical agents, both natural and synthetic (i.e., drugs), affect biological systems) and toxicology (the study of drug overdoses and other poisonings). The minor would be particularly beneficial for students ultimately seeking healthcare-related degrees, and would provide a foundation of knowledge in these areas as students move into graduate-level coursework in these fields.

IMPACT AND RECOMMENDATION

SDSU plans to offer the minor in Pharmacology and Toxicology on campus. SDSU does not request new state resources, and no new courses will be required. SDSU estimates 15 students enrolled and 14 graduates by the fourth year of the program.

Board office staff recommends approval.

ATTACHMENTS

Attachment I – New Program Request Form: SDSU – Minor in Pharmacology and Toxicology

DRAFT MOTION 20230329_5-B(1):

I move to authorize SDSU to offer a minor in Pharmacology and Toxicology, as presented.



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

New Baccalaureate Degree Minor

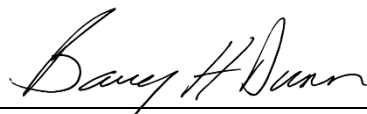
UNIVERSITY:	SDSU
TITLE OF PROPOSED MINOR:	Pharmacology & Toxicology
DEGREE(S) IN WHICH MINOR MAY BE EARNED:	Any
EXISTING RELATED MAJORS OR MINORS:	Pharmaceutical Sciences (B.S.)/Pharmacy (Pharm.D.)
INTENDED DATE OF IMPLEMENTATION:	Fall 2023
PROPOSED CIP CODE:	26.1001
UNIVERSITY DEPARTMENT:	Pharmaceutical Sciences
BANNER DEPARTMENT CODE:	SPRS
UNIVERSITY DIVISION:	College of Pharmacy & Allied Health Professions
BANNER DIVISION CODE:	3P

Please check this box to confirm that:

- The individual preparing this request has read [AAC Guideline 2.8](#), which pertains to new baccalaureate degree minor requests, and that this request meets the requirements outlined in the guidelines.
- This request will not be posted to the university website for review of the Academic Affairs Committee until it is approved by the Executive Director and Chief Academic Officer.

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.



President of the University

12/28/2022

Date

1. Do you have a major in this field? Yes No
2. If you do not have a major in this field, explain how the proposed minor relates to your university mission and strategic plan, and to the current Board of Regents Strategic Plan 2014-2020.

South Dakota State University requests authorization to offer a baccalaureate minor in Pharmacology & Toxicology. Pharmacology is the study of how chemical agents, both natural and synthetic (i.e. drugs), affect biological systems. Toxicology is the study of drug overdoses and other poisonings. SDSU is currently authorized to deliver programs in Pharmaceutical Sciences (B.S., M.S., Ph.D.) and Doctor of Pharmacy.

This undergraduate minor fits with the mission and strategic plan of South Dakota State University. Specifically, the program will feature student-centered education that will contribute to the health of South Dakota, the region, the nation, and the world. The program will contribute to attainment of strategic goal 1 – excellence through transformative education. This will be a distinct and high-quality academic program designed to meet student and market demands. The minor also fits with the South Dakota Board of Regents strategic plan goal of increasing student success, particularly for those students ultimately seeking healthcare-related masters or doctoral degrees.

3. What is the nature/purpose of the proposed minor? Please include a brief (1-2 sentence) description of the academic field in this program.

The undergraduate minor in Pharmacology & Toxicology will enable students to explore fundamental and advanced concepts in pharmacology and toxicology. The minor will be comprised of existing undergraduate courses covering an introduction to pharmacology, toxicology and related pathophysiology.

The university does not request new state resources for the proposed minor. In fact, since existing courses and sections will be used and no new personnel will be needed to teach the courses, this minor should facilitate enrollment in these courses, optimizing course capacity and resource use.

4. How will the proposed minor benefit students?

The minor will be particularly applicable for students ultimately seeking healthcare-related degrees. This includes students seeking the B.S. in Human Biology, B.S. in Biology, or B.S. in Biochemistry with plans to apply to medical school (M.D. or D.O.), physician assistant school (M.S.-P.A.C), dental school (D.D.S & D.M.D.), or optometry school (O.D.). The solid foundation in pharmacology and toxicology provided by this minor will be beneficial as these students move into graduate-level coursework in their healthcare-related field of study.

5. Describe the workforce demand for graduates in related fields, including national demand and demand within South Dakota.

Students earning this minor in pursuit of the B.S. in Human Biology, B.S. in Biology, or B.S. in Biochemistry would have added qualifications for entry to numerous healthcare-related professional programs as listed above. The coursework aims to provide foundational knowledge in pharmacology and toxicology, which should make these students more competitive in their applications to professional school and may set them up for future success in required pharmacology and toxicology-related coursework in their professional programs.

The US Bureau of Labor Statistics project a growth in these healthcare professions ranging from 3% (physician) – 28% (physician assistant).¹ According to the South Dakota Board of Regents Program Demand Gap Analysis (Emsi 2021)², there is a numerical gap in physician assistants, dentists, and optometrists. While there was not an overall gap for physicians, a

¹ U.S. Bureau of Labor Statistics. www.bls.gov Accessed 10/3/2022

² South Dakota Board of Regents Program Demand Gap Analysis: Economic Overview and Review of Academic Programs (Emsi) 2021

numerical gap was also noted for general internal medicine physicians, an occupation that requires a high-level understanding of pharmacology and toxicology.

- 6. Provide estimated enrollments and completions in the table below and explain the methodology used in developing the estimates (*replace “XX” in the table with the appropriate year*).**

The estimates below are based on discussion with leadership within the SDSU College of Natural Sciences, taking into account current student enrollment in pre-health professional programs and student feedback indicating a desire for more coursework opportunities in the areas of pharmacology and toxicology.

<i>Estimates</i>	Fiscal Years*			
	1st	2nd	3rd	4th
	FY 24	FY 25	FY 26	FY 27
Students enrolled in the minor (fall)	10	15	15	15
Completions by graduates	0	9	14	14

*Do not include current fiscal year.

- 7. What is the rationale for the curriculum? Demonstrate/provide evidence that the curriculum is consistent with current national standards.**

The required curriculum in this minor meets undergraduate pharmacy education requirements for the Pharm.D. degree according to the Accreditation Council for Pharmacy Education (ACPE).³ ACPE requirements for education in the areas of pharmacology and toxicology would be expected to meet or exceed pharmacology and toxicology education requirements for most healthcare-related professional programs.

- 8. Complete the tables below. Explain any exceptions to Board policy requested.**

A. Distribution of Credit Hours

Pharmacology & Toxicology	Credit Hours	Percent
Requirements in minor	18	100%
Electives in minor	0	0%
Total	18	

³ Accreditation Council for Pharmacy Education, Standards 2016, <https://www.acpe-accredit.org/pdf/Standards2016FINAL2022.pdf>

B. Required Courses in the Minor

Prefix	Number	Course Title	Prerequisites for Course	Credit Hours	New (yes, no)
BIOL OR BIOL	325-325L 326-326L	Physiology & Lab (4) Biomedical Physiology & Lab (4)	BIOL 325/L: (BIOL 151 or BIOL 153 or BIOL 221) and (CHEM 106 or CHEM 112). BIOL 326/L: (BIOL 153 or BIOL 221) and CHEM 114.	4 (7)	No
PHA	352	Pathophysiology, Pharmacology, Toxicology I	BIOL 325 OR BIOL 326	3	No
PHA	353	Pathophysiology, Pharmacology, Toxicology II	PHA 352	3	No
PHA	452	Pathophysiology, Pharmacology, Toxicology III	PHA 353	4	No
PHA	453	Pathophysiology, Pharmacology, Toxicology IV	PHA 452	4	No
Subtotal				18	

*Credit hours in parentheses () indicate prerequisite courses not counted in the minor requirements. The net number of prerequisites not counted is 7. These prerequisites are fundamental to general education coursework and major requirements (BIOL 151, BIOL 153, BIOL 221, CHEM 106, CHEM 112, and CHEM 114) for students in health-related majors who might choose to earn the minor and therefore not applicable to the minor itself. This includes students seeking a B.S. degree in Human Biology, Biology, or Biochemistry and other Pre-Professional/Career Interest areas with plans to apply to medical school (M.D. or D.O.), physician assistant school (M.S.-P.A.C), dental school (D.D.S & D.M.D.), or optometry school (O.D.).

Students in the B.S. Pharmaceutical Sciences / Pharm.D. program are not eligible for this minor.

C. Elective Courses in the Minor: List courses available as electives in the program. Indicate any proposed new courses added specifically for the minor.

None.

9. What are the learning outcomes expected for all students who complete the minor? How will students achieve these outcomes?

At the completion of the Pharmacology & Toxicology minor students will be able to:

- Describe basic cell physiology, neural, hormonal, and neuroendocrine control systems.

- Explain general mechanisms of drug action, principles of pharmacokinetics/pharmacodynamics, and reasons for individual variations in drug response.
- Compare and contrast pharmacokinetics and pharmacodynamics with toxicokinetics and toxicodynamics.
- Describe the pharmacology of medications used in the treatment of diseases related to the adrenergic and cholinergic systems.
- Describe the pharmacology of central nervous system drugs, behavioral/addiction medications, and analgesic medications.
- Describe general concepts of immunopharmacology, pulmonary pharmacology, anticancer pharmacology, endocrine pharmacology and antimicrobial therapy.
- Explain mechanisms of toxicity and recognize adverse effects of medications and other poisons.
- Recommend appropriate treatment for a poisoned patient.

Individual Student Outcome	Program Courses that Address the Outcomes				
	BIOL 325-325L OR BIOL 326-326L	PHA 352	PHA 353	PHA 452	PHA 453
Describe basic cell physiology, neural, hormonal, and neuroendocrine control systems.	X				
Explain general mechanisms of drug action, principles of pharmacokinetics/pharmacodynamics, and reasons for individual variations in drug response.		X			
Compare and contrast pharmacokinetics and pharmacodynamics with toxicokinetics and toxicodynamics.		X			
Describe the pharmacology of medications used in the treatment of diseases related to the adrenergic and cholinergic systems.			X		
Describe the pharmacology of central nervous system drugs, behavioral/addiction medications, and analgesic medications.				X	
Describe general concepts of immunopharmacology, pulmonary pharmacology, anticancer pharmacology, endocrine pharmacology and antimicrobial therapy.				X	X
Explain mechanisms of toxicity and recognize adverse effects of medications and other poisons.					X
Recommend appropriate treatment for a poisoned patient.					X

10. What instructional approaches and technologies will instructors use to teach courses in the minor? *This refers to the instructional technologies and approaches used to teach courses and NOT the technology applications and approaches expected of students.*

The courses associated with the minor are taught in a face-to-face lecture-based format. Assessment is performed via exams, quizzes, and written assignments in D2L.

11. Delivery Location

Note: The accreditation requirements of the Higher Learning Commission (HLC) require

Board approval for a university to offer programs off-campus and through distance delivery.

A. Complete the following charts to indicate if the university seeks authorization to deliver the entire program on campus, at any off campus location (e.g., USD Community Center for Sioux Falls, Black Hills State University-Rapid City, Capital City Campus, etc.) or deliver the entire program through distance technology (e.g., as an online program)?

	Yes/No	Intended Start Date
On campus	Yes	2023-2024 Academic Year

	Yes/No	If Yes, list location(s)	Intended Start Date
Off campus	No		

	Yes/No	If Yes, identify delivery methods <i>Delivery methods are defined in AAC Guideline 5.5.</i>	Intended Start Date
Distance Delivery (online/other distance delivery methods)	No		
Does another BOR institution already have authorization to offer the program online?	No	If yes, identify institutions:	

A. Complete the following chart to indicate if the university seeks authorization to deliver more than 50% but less than 100% of the certificate through distance learning (e.g., as an on-line program)? *This question responds to HLC definitions for distance delivery.*

	Yes/No	If Yes, identify delivery methods	Intended Start Date
Distance Delivery (online/other distance delivery methods)	No		

12. Does the University request any exceptions to any Board policy for this minor? Explain any requests for exceptions to Board Policy. *If not requesting any exceptions, enter "None."*

The university requests an exception to the Board policy that limits minors to a total of 18 credits, including prerequisites. The proposed Pharmacology and Toxicology minor is intended for students earning a bachelor’s degree in a health-related or science field. This includes students seeking a B.S. degree in Human Biology, Biology, or Biochemistry and other Pre-Professional/Career Interest areas with plans to apply to medical school (M.D. or D.O.), physician assistant school (M.S.-P.A.C), dental school (D.D.S & D.M.D.), or optometry school (O.D.). Students will complete the prerequisites as part of the basic bachelor’s degree requirements, regardless of the minor.

13. Cost, Budget, and Resources: Explain the amount and source(s) of any one-time and

continuing investments in personnel, professional development, release time, time redirected from other assignments, instructional technology & software, other operations and maintenance, facilities, etc., needed to implement the proposed minor.
Address off-campus or distance delivery separately.

Existing courses and personnel will be utilized for this minor. Students seeking the majors in which this minor may be earned are already required to take BIOL 325-325L or BIOL 326/326L and seats are currently available in PHA 352, PHA 353, PHA 452, and PHA 453 for these students to take these courses in existing sections. The proposed Pharmacology and Toxicology minor is intended for students earning a bachelor's degree in a health-related or science field. This includes students seeking the B.S. Human Biology, Biology, or Biochemistry and other Pre-Professional/Career Interest areas with plans to apply to medical school (M.D. or D.O.), physician assistant school (M.S.-P.A.C), dental school (D.D.S & D.M.D.), or optometry school (O.D.). Students will complete the prerequisites as part of the basic bachelor's degree requirements, regardless of the minor.

14. New Course Approval: New courses required to implement the new minor may receive approval in conjunction with program approval or receive approval separately. Please check the appropriate statement.

YES,

the university is seeking approval of new courses related to the proposed program in conjunction with program approval. All New Course Request forms are included as Appendix C and match those described in section 7.

NO,

the university is not seeking approval of all new courses related to the proposed program in conjunction with program approval; the institution will submit new course approval requests separately or at a later date in accordance with Academic Affairs Guidelines.