SOUTH DAKOTA BOARD OF REGENTS
ACADEMIC AFFAIRS FORMS

New Certificate

UNIVERSITY:	**SDSU**
TITLE OF PROPOSED CERTIFICATE:	**Pharmacology**
INTENDED DATE OF IMPLEMENTATION:	**Fall 2023**
PROPOSED CIP CODE:	**51.2010**
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 2.7, which pertains to new certificate 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.

Institutional Approval Signature — 12/28/2022 Date

President or Chief Academic Officer of the University

1. Is this a graduate-level certificate or undergraduate-level certificate?

Undergraduate Certificate ☒ Graduate Certificate ☐

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

South Dakota State University (SDSU) requests authorization to offer a Pharmacology Certificate. The undergraduate certificate in Pharmacology will enable students to explore fundamental concepts in pharmacology, which is the study of how chemical agents, both natural and synthetic (i.e. drugs), affect biological systems. The certificate will be comprised of existing undergraduate courses covering an introduction to pharmacology and related pathophysiology.

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

3. If you do not have a major in this field, explain how the proposed certificate relates to your university mission and strategic plan, and to the current Board of Regents Strategic Plan 2014-2020.

SDSU is currently authorized to deliver programs in Pharmaceutical Sciences (B.S., M.S., Ph.D.) and the Doctor of Pharmacy.

This certificate 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 certificate 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.

4. Provide a justification for the certificate program, including the potential benefits to students and potential workforce demand for those who graduate with the credential.

The fundamental concepts in pharmacology provided by this certificate should be beneficial as these students pursue graduate-level coursework in a healthcare-related professional field of study (see below: physician, physician assistant, dental, and optometry). The coursework aims to provide foundational knowledge in pharmacology, which should make these students more competitive in their applications to professional school and may set them up for future success in required pharmacology-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 numerical gap was also noted for general internal medicine physicians, an occupation that requires a high-level understanding of pharmacology.

5. Who is the intended audience for the certificate program (including but not limited to the majors/degree programs from which students are expected)?

The certificate will be particularly applicable for students ultimately seeking healthcare-related masters or doctoral degrees. This includes students seeking the B.S. in Human Biology or B.S. in Biology 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.).

6. Certificate Design

[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

A. Is the certificate designed as a stand-alone education credential option for students not seeking additional credentials (i.e., a bachelor's or master's degree)? If so, what areas of high workforce demand or specialized body of knowledge will be addressed through this certificate?

This certificate is not a stand-alone credential.

B. Is the certificate a value added credential that supplements a student's major field of study? If so, list the majors/programs from which students would most benefit from adding the certificate.

The certificate will be a value-added credential for students pursuing acceptance to healthcare-related professional programs, providing substantial experience in pharmacology, which may help separate these students from other applicants. Students enrolled in the Human Biology or Biology majors and other health-related Pre-Professional/Career Interest areas with plans to apply to medical school will benefit the most from the certificate.

C. Is the certificate a stackable credential with credits that apply to a higher level credential (i.e., associate, bachelor's, or master's degree)? If so, indicate the program(s) to which the certificate stacks and the number of credits from the certificate that can be applied to the program.

The certificate would be stackable to the B.S. programs for Human Biology and Biology. Ten credits from the certificate could be applied to the bachelor's degree.

7. List the courses required for completion of the certificate in the table below (if any new courses are proposed for the certificate, please attach the new course requests to this form).

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
			Subtotal	10	

*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) required to be taken by students in health-related majors who might choose to earn the minor and therefore not applicable to the minor itself.

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

8. Student Outcome and Demonstration of Individual Achievement.
Board Policy 2:23 requires certificate programs to "have specifically defined student learning outcomes.

A. What specific knowledge and competencies, including technology competencies, will all students demonstrate before graduation?

Students completing this certificate will demonstrate knowledge of fundamental concepts of drug action, pharmacokinetics/pharmacodynamics, and toxicokinetics/toxicodynamics. Students will be able to describe the pharmacology of medications used in the treatment of diseases related to the adrenergic and cholinergic systems.

B. Complete the table below to list specific learning outcomes – knowledge and competencies – for courses in the proposed program in each row.

At the completion of the Pharmacology certificate 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.

	Program Courses that Address the Outcomes		
Individual Student Outcome	BIOL 325-325L OR BIOL 326-326L	PHA 352	PHA 353
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

9. 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 College 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 on-line 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*** *Delivery methods are defined in AAC Guideline 5.5.*	***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:**	

B. 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		