

SOUTH DAKOTA BOARD OF REGENTS

Academic and Student Affairs
Consent

AGENDA ITEM: 5 – A (4)
DATE: April 2-3, 2025

SUBJECT

New Program Request – NSU – BSEd in Science Education

CONTROLLING STATUTE, RULE, OR POLICY

[BOR Policy 2.3.2](#) – New Programs, Program Modifications, and Inactivation/Termination

BACKGROUND / DISCUSSION

Northern State University (NSU) requests authorization to offer a BSEd in Science Education. The proposed program will provide a path to teaching certification in multiple science disciplines through one comprehensive major. NSU’s Science Education degree prepares individuals through content knowledge and practical experiences to teach a wide range of science courses. Upon completion of this program individuals learn a combination of biological, physical, geographical, chemical, and earth sciences and are able to share the excitement of general science at the middle and high school level.

The intent to plan has been approved by the Executive Director and was presented to the Board as an informational item at the June 2023 Board meeting.

IMPACT AND RECOMMENDATION

A summary of the program proposal has been included as Attachment I. Additional information on this proposal is available from the Board office by request.

ATTACHMENTS

Attachment I – New Program Request Summary: NSU – BSEd in Science Education

DRAFT MOTION 20250402_5-A(4):

I move to authorize NSU to offer a BSEd in Science Education, as presented.

**Full Proposal – BSEd Science Education
Northern State University**

BOR Recommendation: The Board of Regents Academic Affairs and the Executive Director support the program request. This program has the potential to increase the number of secondary science teachers who will be well-prepared to teach a wide range of subjects, which is particularly valuable for rural school districts.

Program Description:

Catalog Description: Northern State University's BSEd Science program provides a path to teaching certification in multiple science disciplines through one comprehensive major. NSU's Science Education degree prepares individuals through content knowledge and practical experiences to teach a wide range of science courses. Upon completion of this program, individuals learn a combination of biological, physical, geographical, chemical, and earth sciences and are able to share the excitement of general science at the middle and high school levels.

Strategic Impact –

NSU Strategic Impact:

Northern State University (NSU) is statutorily authorized to offer university academic programs in accordance with SDCL § 13-59-1 “in the preparation of elementary and secondary teachers, and a secondary purpose is to offer preprofessional, one-year and two-year terminal and junior college programs.” Board Policy 1:10:6 establishes the mission of NSU as a comprehensive regional university to: “serve the educational and programming needs of [its] geographic region and offer several undergraduate and limited master’s-level programs. Faculty emphasis is on teaching, scholarly research and creative activity, and service. Universities operating within this sector are nationally recognized to promote access to affordable education in a regional location. Northern State University (NSU) focuses on personalized teaching and student services and expands access through its special emphasis on E-Learning. NSU has unique characteristics and is critical in advancing student access, affordability, degree completion, and quality education in South Dakota.”

NSU’s mission is to “provide diverse academic, civic, social and cultural opportunities that prepare students through the liberal arts, professional education, and E-learning for their future endeavors, while also enriching the local and regional community.” Developing the next level of educator-scholars, versed in all areas of science and equipped with practical experiences, meets the mission of the University through educational opportunities and community outreach. The BSEd in Science meets and supports the NSU mission, primarily by providing preparation for teachers and serving the educational needs of the region as well as the workforce needs of the region and nation.

To help Northern students pursuing careers in secondary education, Northern State University now generally facilitates our students earning two degrees a - BS in their content area (Biology or Chemistry) and a BSED Secondary Education. This same approach to earn two degrees - one in secondary education and one in a content area - is not possible with the BSED Science because there is not a stand-alone degree called BS Science and nor would there be any demand for that stand-alone degree. Also, the number of 100 and 200-level classes needed across the sciences would make it impossible to create a robust stand-alone degree called BS Science. The BSED

Science is similar to the BSED Social Sciences, and both of those programs need to be stand-alone degrees to enable students to learn the content and pedagogy they need to teach effectively.

BOR Strategic Impact:

Through the BSEd Science, Northern will offer a comprehensive science education program that integrates a combination of biology, chemistry, geography, physics, and earth science in one degree. Through this degree, Northern will professionally prepare students for careers teaching across disciplines in the sciences, enabling them to better serve students in small regional and rural schools.

The proposed program contributes directly to BOR Strategic Plan Goal 3 (Academic Excellence, Student Success, and Educational Attainment), Academic Excellence Action Step 2, which calls for prioritizing new program proposals with high-impact practices and workforce alignment. [1] Students in Northern's BSEd Science program will integrate lab experiences, undergraduate research, practical experiences, and/or other similar high-impact practices into their understanding of the scientific method.

Students graduating from NSU's BSED Secondary Education and BS Biology / BS Chemistry already gain practical experiences through undergraduate research, serving as a STEM outreach educator, or both. These experiences build confidence and skills with science content and delivery. STEM outreach at NSU is overseen by a School of Education graduate student and science faculty member and allows pre-service teachers to design and deliver science programs to elementary classrooms in northeastern South Dakota. Topical science programs range from chemical to life science to physical, all focusing on important science standards addressed in the elementary classroom. Each developed training will include science and math in the curriculum, built around a particular topic with project development and statistical training included. As part of these efforts, we will also formulate a successful internship program for students pursuing careers as STEM educators to help increase the number of teachers in these fields and provide well-trained, knowledgeable teachers in the workplace while influencing young minds at the elementary and middle school levels. To date, the program has been very successful and continues to grow, and with the help of the new Harvey Jewett IV Regional Science Education Center (RSEC), NSU continues to expand its efforts to bring science education to more communities and students in the region.

It also will contribute to Goal 4 (Workforce and Economic Development), Workforce Alignment Action Step 1 which calls for the alignment of new or enhanced undergraduate programs to the South Dakota and national workforce and will contribute to Workforce Alignment Action Step 3, which places special emphasis on STEM, Teacher Education, Nursing and Healthcare, and Business undergraduate completion.

Research shows that achievement and interest in science and math fields falter after 4th grade and significantly drop at 8th grade. [2] After this point, the decreased interest in learning science and math affects the aptitude of young minds. However, STEM fields are growing rapidly, particularly in the healthcare and computer science arenas. Data show that careers in STEM fields will continue to rise over the next decade. [3] To accommodate this need, it is increasingly important to train teachers and expose students early and often to STEM fields. To meet the secondary education STEM shortage, it is imperative to consider different educational models for training secondary teachers, as they relate to science and math, as well as to provide additional opportunities to learn science and math from individuals trained in such fields. Key elements to

successfully expose students to STEM fields are: 1) teachers who are knowledgeable in science and math content, 2) effective delivery methods, and 3) adequate time to cover topics. Providing a comprehensive degree that provides secondary teachers with a base knowledge across multiple science fields prepares teachers with the knowledge and pedagogical skills to adequately deliver a variety of science topics and it exposes teacher candidates to multiple projects, labs, and assignments across science fields, better preparing them to create effective science lessons.

- [1] SDBOR Strategic Plan. https://sdbor.edu/wp-content/uploads/2023/09/StrategicPlan_22_27.pdf
 [2] National Science and Technology Council. https://obamawhitehouse.archives.gov/sites/default/files/microsites/ostp/stem_stratplan_2013.pdf
 [3] The South Dakota Department of Labor and Regulation. Occupational Employment Projections - Long Term. https://dlr.sd.gov/lmic/lb/2022/lbart_sept22_occupational_projections_2020_2030.aspx

Program Summary:

The classification of this program will be 13.1316 [Science Teacher Education, General Science Teacher Education]. This program is proposed to be offered beginning Fall 2025 on campus at NSU as well as online utilizing Hy-Flex teaching methods. This program will be included in NSU CAEP and SD Department of Education accreditations for teacher preparation programs.

Duplication and Competition:

Black Hills State University is the only institution among the six regental schools that provides a similar program. In 2021-2022, BHSU had 4 graduates of the BSEd Science Education, and in 2022-2023, BHSU had 1 graduate of the BSEd in Science Education. Northern State University seeks to provide such a program due to the nature of the middle and high schools our region serves. Many schools are rural in northeastern and central South Dakota, and these schools require teachers versed in a variety of science disciplines. Currently, NSU focuses on either biology or chemistry, which does not adequately prepare teachers to teach sciences in all areas. NSU requests this degree to address the needs of the region.

The Integrated Postsecondary Education Data System (IPEDS) for 2022-2023 reporting shows that South Dakota produced a total of **5 undergraduate** completers in related fields.

Regental Universities¹:

University	Bachelor's Degrees Conferred in Related Fields	Total Number of Bachelor's Degrees Conferred at Each Institution
BHSU – Math and Science Education, BSEd	0	370
BHSU – Science Education, BSEd	1	

¹ Integrated Postsecondary Education Data System (IPEDS) for 2022-2023

NSU - Biology	2	285
NSU – Chemistry Education, BSEd	0	
SDSU – Biology Education, BSEd	0	1824
SDSU – Chemistry Education, BSEd	1	
SDSU – Physics Education, BSEd	0	
USD – Biology Education, BSEd	0	1166
USD – Chemistry Education, BSEd	0	

Private SD Universities²:

University	Bachelor’s Degrees Conferred in Related Fields	Total Number of Bachelor’s Degrees Conferred At Each Institution
Dakota Wesleyan, Biology Education, BSEd, and Science Teacher Education, BSEd	0	149
Mount Marty University, Biology Education, BSEd, and Chemistry Education, BSEd	1	136

Total Sum of SD Findings:

University	Total Bachelor’s Degrees in Related Fields Conferred in SD	Total Number of Bachelor’s Degrees Conferred (All SD Universities Listed Above)
Total	5	3930

Competitor University Peers³:

University	Total Bachelor’s Degrees in Related Fields Conferred	Total Number of Bachelor’s Degrees Conferred at Each Institution
University of Maine, Farmingham; Secondary Education Science, BSEd	1	280

² Integrated Postsecondary Education Data System (IPEDS) for 2022-2023

³ IPEDS, 2022-2023

Midwestern State University Texas; Secondary Education Science, BSEd	0	235
University of Wisconsin – Superior; Broad Field Science, BSEd	0	405

Workforce Outlook/State Need:

Middle and high school science teachers are needed in South Dakota, as apparent from job searches on SchoolSpring (<https://www.schoolspring.com/>), Indeed (<https://www.indeed.com/>), and K12Jobspot (<https://k12jobspot.com/>). Specifically searching for science middle and high school teachers on these sites, there were 13 unique positions in rural locations in South Dakota. Not all positions are posted on these sites, as districts advertise their positions and may not utilize more universal search engines.

All postings are listed as “high school science” or “middle school science” with a generalization of understanding and teaching science in mind/need. Some positions include math as a part of the requirements. A current search posted by E-learning at Northern State University states that “successful candidates should be confident in their subject mastery, well-versed in content standards, and dedicated to sharing their instructional skills with students across the state.” This also suggests the need to be broadly trained in science to effectively teach in rural communities.

With a general search for “science teacher” through K12Jobsot, over 2,000 positions were identified within the United States. Most of these positions are at private and public schools, or private entities, which require science educators versed in all areas of science.

The most recent US Bureau of Labor and Statistics’ Occupational Outlook Handbook indicates that the 2021 median pay for middle school teachers is \$61,320 and the median pay for high school teachers is \$61,820.

Based on the South Dakota Department of Education “data dashboard,” [4] the median baseline salary of new teachers in South Dakota in Aberdeen, SD is \$42,500. According to the South Dakota Department of Labor, the median wage estimate for South Dakota middle school teachers is \$48,037, and for high school teachers is \$48,096 (both with a range of \$37,793 to \$60,902) [5]. Data are not specific to science.

[4] <https://doe.sd.gov/data/Teacher-Salary.aspx>

[5] https://dlr.sd.gov/lmic/menu_occupational_wages.aspx

Student Learning Outcomes:

Students will:

1. Design, interpret, and discuss scientific data: Develop the capability to create, comprehend, and critically discuss scientific data, applying principles of scientific inquiry.

2. Communicate scientific findings effectively: Demonstrate effective communication of scientific findings through both oral and written presentations, utilizing discipline-specific methodologies and tools.
3. Evaluate sources and analyze data: Identify, evaluate, and synthesize relevant scientific sources to accurately analyze and interpret data.
4. Demonstrate collaborative research skills: Exhibit teamwork and collaboration skills in research and project-based activities, contributing effectively to group efforts and shared objectives.
5. Design and conduct scientific research: Show proficiency in designing and conducting original scientific research, adhering to established methodologies.
6. Establish proficiency in core scientific disciplines: Acquire comprehensive knowledge and practical skills across foundational scientific areas, including biology, chemistry, physics, and earth sciences.

Projected Enrollment:

ESTIMATES	FISCAL YEARS*					
	1st Year	2nd Year	3rd Year	4th Year	5th Year	6th Year
Students new to the university	6	6	7	7	8	9
Students from other university programs	1	2	3	3	3	3
Students off-campus or distance continuing students	1	2	3	3	3	3
		7	10	10	11	12
Total students in the program (fall)	8	17	23	23	25	27
Program credit hours (major Courses)**	704	1496	2059	2059	2218	2376
Graduates			2	6	8	10
<i>*Do not include current fiscal year.</i>						
<i>**This is the total number of credit hours generated by students in the program in the required or elective program courses. Use the same numbers in Appendix B – Budget.</i>						

The current enrollment in the BSEd Biology and BSEd Chemistry programs, combined, is nine students. Northern State University led the South Dakota Board of Regents initiative to start an apprenticeship program for Secondary Education students. Drawing from current enrollments in the Secondary Education apprenticeship program and using these numbers along with the interest by prospective students, i.e., the number of student inquiries for Secondary Science programs, NSU started with 8 students with projected growth thereafter. NSU was conservative in its estimates. Each year they anticipate 80% of the students to persist within the program, thus the estimation of continuing students is 80% of the total students new to the program. They anticipate growth because they are beginning to offer

courses in the science content area of the BSEd Secondary Science as HyFlex to allow flexibility in student learning, capture a wider audience, support the apprenticeship program, and grow the BSEd Secondary Science degree.

Projected Revenue/Expenses:

FINANCIAL HEALTH SUMMARY						
	1st FY24	2nd FY25	3rd FY26	4th FY27	5th FY28	6th FY29
TUITION & FEE REVENUES	42,338	86,820	116,941	116,941	127,293	137,644
PROGRAM EXPENSES	53,012	54,364	55,716	57,068	58,420	59,772
NET (T&F REVENUES LESS PROGRAM EXPENSES)	(10,674)	32,456	61,225	59,873	68,872	77,872
OTHER SUPPORTING REVENUES	-	-	-	-	-	-
NET AFTER OTHER SUPPORTING REVENUES	(10,674)	32,456	61,225	59,873	68,872	77,872

NSU is not making any new one-time or continuing investments in personnel, instructional technology, or facilities to support the BSEd Science Education. All of the courses in the BSEd Science Education are already taught at Northern by existing faculty in sciences and education. NSU is creating this major to directly address the needs of school districts in the region and to give Northern students the opportunity to earn a degree that best meets and prepares them for their career goals. Students who want to be science teachers in small to mid-sized districts are expected to teach across all science disciplines, and the BSEd Science Education better prepares them to teach their students than a stand-alone biology education or chemistry education degree.

Existing faculty in science and education can teach the students in this program, as they already offer all of the courses. Since most of the science courses are introductory, faculty can increase the lecture section without impacting workload. Faculty workload in the education program is well managed to maximize efficiencies and enrollments. The Education Dean and Chair are confident they can manage the students in this program with the addition of one course each semester.