New Academic Degree Program
Full Proposal Application
South Dakota Board of Regents
Academic Affairs Forms

Internal Ticket ID: 20883
Created: 11/1/2024
Modified: 11/20/2024

Use this form to propose a new degree program. The Board of Regents, Executive Director, and/or their designees may request additional information about the proposal. After the university President approves the proposal, submit a signed copy to the Executive Director through the System Academic Officer (through the online submission process).

Note: Within the proposal, all references to external sources should be documented with a footnote (including web addresses where applicable).

University	NSU - Northern State University
Degree	BSED : Bachelor of Sci in Education
Name of Major	X999 : New Major Requested **Science Education**
Specialization Required?	No
	Note: If the new proposed program includes specific specializations within it, complete and submit a New Specialization Form for each proposed specialization and attach it to this form. Since specializations appear on transcripts, they require Board approval.
College/Department	5A : NSU College of Arts & Sciences/NSCM : Science and Mathematics
Planned CIP Code	13.1316
WICHE WRRGP Eligibility	

Program Description

1. Provide the working program description that may appear in the university catalog.

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 level.

2. Does the university request any exceptions to any Board policy for this program?
Explain any requests for exceptions to Board Policy. If not requesting any exceptions, indicate ***"None."***

None.

Strategic Impact

3. Describe how the program fits in with the institutional mission, strategic plan, existing institutional program array, and academic priorities.

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 pursing 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.

If the program does not align to the strategic plan, provide a compelling rationale for the institution to offer the program.

N/A

4. How does the program connect to the Board of Regent’s Strategic Plan?

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 expereiences, 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 numbers of teachers in these fields, provide well-trained, knowledgeable teachers into the work place 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 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 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

5. If a new degree is proposed, what is the rationale?

This question refers to the type of degree, not the program. For example, if your university has authorization to offer the Bachelor of Science and the program requested is a Bachelor of Science, then the request is not for a new degree.

N/A

6. What modality/modalities will be used to offer the new program?

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.

	Yes/No	Intended Start Date
On Campus	Yes	Fall 2025

	Yes/No	Location(s)	Intended Start Date
Off Campus Location	No		

	Yes/No	Delivery Method(s)	Intended Start Date
Distance Delivery	Yes	Online; HyFlex	Fall 2025

	Yes/No	Identify Institutions
Does another BOR institution already have authorization to offer the program online?	No	

7. If the program will be offered through distance delivery, identify the planned instructional modality:

Both / HyFlex

8. What are the student learning outcomes for this program?

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.

9. For associate's and bachelor's degree proposals, identify the 3-5 AAC&U Essential Learning Outcomes that have been selected for this program.

Use the chart below to indicate the student learning outcomes that align to the selected ELOs (See BOR Policy 2.11 and Guideline 8.5).

Essential Learning Outcomes (AAC&U)	Student Learning Outcomes
Inquiry and Analysis	1, 2, 3, 5
Critical and Creative Thinking	
Information Literacy	1, 2, 3
Teamwork	4
Problem Solving	1, 3, 5
Civic Knowledge and Engagement	
Intercultural Knowledge	
Ethical Reasoning	
Foundational Lifelong Learning Skills	
Integrative Learning	2, 3, 6

10. Enter the number of credit hours required to graduate

Credit Hours	120

11.Complete the following tables to provide a degree program curriculum summary.

A. Table 1 –Total Program Degree Credit Hours

	Credit Hours In Program	
	Hours Per Requirement	**%Total Hours**
System General Education Requirements	32	
Subtotal - Gen Ed Requirements	32	%
Program Requirements		
Required Support Courses	0	
Major Requirements	79	
Major Electives	7	
Subtotal - Program Requirements	88	%
Free Electives	0	
Subtotal - Free Electives	0	%
Degree Total	120	%

**Board Policy 2:29 requires each baccalaureate level degree program to require 120 credit hours and each associate degree program to require 60 credit hours. Exceptions to this policy require documentation that programs must comply with specific standards established by external accreditation, licensure, or regulatory bodies or for other compelling reasons, and must receive approval by the Executive Director in consultation with the President of the Board of Regents.*

B. Table 2 – Insert Required Program Support Courses Impacting Other Programs (outside department). Do not include General Education courses.

*The individual curriculum tables should be included as a word document **attached** to the TDX ticket.*

C. Table 3 – Insert Major Requirements (within department)

*The individual curriculum tables should be included as a word document **attached** to the TDX ticket.*

D. Table 4 – Insert Major Electives

*The individual curriculum tables should be included as a word document **attached** to the TDX ticket.*

12. New Course Approval

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

Yes

Academic Quality

13. What peer institutions and current national standards will be referenced to develop the curriculum for this program?

Peer Institution: Regional and Competitive institutions. Include links to at least 3 comparable programs at peer institutions and links to national or accreditation standards, if any.

Northern State University follows CAEP accreditation standards for the education curriculum [4] and follows SD Department of Education standards and competencies for the science content curriculum. [5]

Northern also analyzed and drew from secondary science education programs at peer institutions to develop the curriculum for the BSEd Science. The institutions are of a similar size and mission. This determination is made through the National Center for Education Statistics (NCES) per Chronicle of Higher Education data as well as membership within the Council of Public Liberal Arts Colleges (COPLAC):

BS Secondary Education Science - University of Maine Farmington (COPLAC peer institution)

BSE Secondary Education Science – Midwestern State University Texas (COPLAC peer institution)

BA/BS Broad Field Science – University of Wisconsin, Superior (NCES peer institution)

[4] CAEP Standards. https://caepnet.org/standards/2022-itp/introduction
[5] SD Department of Education. Science Standards. 2024. https://doe.sd.gov/contentstandards/documents/24-SciStandards.pdf
[6] https://catalog.farmington.edu/preview_program.php?catoid=5&poid=332
[7] https://catalog.msutexas.edu/preview_program.php?catoid=35&poid=4878&returnto=1909
[8] https://www.uwsuper.edu/admissions/majors-minors/broad-field-science_majorminor1752673

14. What program accreditation is available, if any?

Accreditation will be through CAEP in the same way the BSEd Social Sciences is accredited as a stand-alone degree. The BSEd in Science aligns with the Secondary Intermediate Science endorsement from the SD Department of Education. The required coursework includes a minimum of 10 transcripted credits in Biology, a minimum of 8 transcripted credits in Physical Science, and minimum of 8 transcripted credits in Earth Science.

Because students will receive foundational instruction in multiple science disciplines (biology, chemistry, environmental science, earth science, geography, and physics), students will be prepared to take/pass the 5442 Praxis Middle School Science exam and the 5436 Praxis General Science exam, which prepares students for comprehensive science certification at the respective levels.

Students can gain deeper knowledge in a specific science discipline by dedicating the upper level science electives in the degree program to one specific discipline. Through the program, students will gain general knowledge in multiple science disciplines that will give them a base of understanding to study further in one specific discipline and take the Praxis exam in that discipline after they graduate. Graduates with the BSEd Science who want to gain deeper knowledge in one specific science discipline to take that Praxis exam (e.g. biology) will be encouraged to earn a MSEd Teaching and Learning: Expertise in a Discipline from Northern. That master's degree includes 18 graduate credits in a specific discipline (e.g. biology).

15. Will the proposed program pursue accreditation or certifications?

Yes

If no, why has the department elected not to pursue accreditation for the program?

N/A

16. Did the university engage any developmental consultants to assist with the development of the curriculum? Did the university consult any professional or accrediting associations during the development of the

curriculum? What were the contributions of the consultants and associations to the development of the curriculum?

Developmental consultants are experts in the discipline hired by the university to assist with the development of a new program, including content, courses, and experiences, etc. Universities are encouraged to discuss the selection of developmental consultants with Board staff.

The University did not consult external developers. The Dean of the Millicent Atkins School of Education and the Chair of Teacher Education as well as the Secondary Education faculty collaborated with Northern's Science Department Chair and Science faculty to develop the curriculum.

Northern will gain approval from the SD Board of Education to gain authority to certify in this area. The degree aligns with Secondary Intermediate Science requirements for the SD Department of Education. The required coursework includes a minimum of 10 transcripted credits in Biology, a minimum of 8 transcripted credits in Physical Science, and minimum of 8 transcripted credits in Earth Science. This degree will qualify individuals to teach all areas of science in North Dakota.

17. Inclusion of High Impact Practices (HIP) across all undergraduate programs is a strategic priority of the Board of Regents to enhance academic quality and increase student engagement. For associate's and bachelor's degree proposals, which HIPs will faculty embed into the program?

Mark all that apply. To be considered as a HIP program, two or more should be selected and required in the program.

High Impact Practices	Included
Capstone courses and projects	Yes
Collaborative assignments and projects	Yes
Common intellectual experiences	Yes
Diversity/global learning	Yes
ePortfolios	No
First year experiences	Yes
Internships	Yes
Learning communities	No
Service learning, community-based learning	No
Writing intensive courses	Yes
Undergraduate research	Yes

18. For associate's and bachelor's degree proposals, discuss how HIPs will be embedded into the program

Your discussion should provide examples and include whether the HIP is required or an optional component. It should also indicate at what point the experience is offered or required. (eg "students will be required to participate in an internship during their third year of enrollment in order to develop skills in…").

* All students at NSU participate in First Year Experiences and are required to take a writing intensive course. Students will have collaborative assignments and projects and common intellectual experiences in all of the science classes.
* Students are required to complete field experiences and internships (as applicable) in EPSY 296, SEED 396, SEED 496, and SEED 488 (Student Teaching).
* Additional internship opportunities are available through local/regional agencies such as Game, Fish & Parks, Avera and Sanford Medical, and One-Legged Pheasant Brewing.
* Students have multiple undergraduates research opportunities (e.g., HHMI SEA-PAHGES (Howard Hughes Medical Institute Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science).
* Students have opportunities to participate in STEM outreach practical experiences by visiting local-area schools and working with K-12 STEM educators.

Student Success

This section outlines the university's plan to assess student achievement of the program learning outcomes.

19. Complete the table below to provide evidence of a preliminary assessment plan. Place an asterisk next to assessments that are national or state-level instruments.

Note: It is only necessary to indicate the summative assessment for each outcome, not the formative assessments used throughout the program.

Program Learning Outcome	Course	Summative Assessment
Design, interpret, and discuss scientific data; Communicate scientific findings effectively; Evaluate sources and analyze data; Design and conduct scientific research	BIOL 151/L and every science course with a lab	Lab Reports
Demonstrate collaborative research skills	SEED 413 and all 300 and 400 level education courses	Projects
Establish proficiency in core scientific disciplines	BIOL 151/L, CHEM 112/L, PHYS 111/L	Exams

20. How will outcomes for graduates of the program be assessed?

Outcomes may include employment and placement rates, licensure examination pass rates, acceptance rates to graduate school, student or employer surveys, or other assessments of graduate outcomes.

We will use Praxis pass rates and employment success rates to determine the success of this program. In addition, we will use the capstone course and associated projects to determine science literacy. The education program utilizes pre-service evaluation tools, which will also be utilized to evaluate the success of this program. We will meet all CAEP standards for content as well as teacher training, and assessment related to this accrediting body will also be used.

Because students will receive thorough instruction in multiple science disciplines (biology, chemistry, environmental science, earth science, geography, and physics), students will be prepared to take/pass the 5442 Praxis Middle School Science exam and the 5436 Praxis General Science exam, which prepares students for comprehensive science certification at the respective levels. If a high school requires a content specific exam to teach AP courses, students will have the base knowledge in multiple disciplines and can choose their upper level science electives in the major program to prepare themselves for a Praxis exam in a specific content area.

Duplication and Competition

21. Do any related programs exist at other public universities in South Dakota?

A list of existing programs is available through the university websites and the RIS Reporting: Academic Reports Database. If there are no related programs within the Regental system, indicate ***none.***

Black Hills State University – BSEd Math & Science Education
This program provides a composite teaching major in science and math. Students prepare to teach math and select one science teaching field from biology, chemistry, earth science, and physics. Our proposal does not include mathematics and has a broad multi-disciplinary function, whereas this BHSU program includes a single science discipline.

Black Hills State University – BSEd Science Education
This program prepares students to teach in two science content areas: biology, chemistry, earth science or physics. The key difference between this and our proposed program is that students in the BHSU program must take 24 credit hours from each of two different science disciplines (48 hours total), which lacks the broad multi-disciplinary function of our proposal.

South Dakota State University – BSEd Biology Education (5-12)
This program prepares students to teach biology in middle school and high school. While this program focuses on one science discipline, our program has a multi-discipline focus within the sciences. While the SDSU website directs that secondary education majors "that may teach in a rural school or apply to graduate school, speak to an advisor about taking additional chemistry, physics, and math classes," our program is specifically geared toward students who intend to teach in small rural or regional schools, so it naturally incorporates these types of courses within the curriculum rather than encouraging taking these additional courses above and beyond what is required for the major.

South Dakota State University – BSEd Chemistry Education (5-12)
This program prepares students to teach chemistry in middle school and high school. While this program focuses on one science discipline, our program has a multi-discipline focus within the sciences.

South Dakota State University – BSEd Physics Education (5-12)
This program prepares students to teach physics/physical science in middle school and high school. While this program focuses on one science discipline, our program has a multi-discipline focus within the sciences.

University of South Dakota – BSEd Biology Education
This program prepares students to teach biology in middle school and high school. While this program focuses on one science discipline, our program has a multi-discipline focus within the sciences.

University of South Dakota – BSEd Chemistry Education
This program prepares students to teach chemistry in middle school and high school. While this program focuses on one science discipline, our program has a multi-discipline focus within the sciences.

A. If yes, defend the need for an additional program within the state, Include IPEDS enrollment data and additional data as needed.

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. We request this degree to address the needs of the region.

B. If yes, would this program be a candidate for Regental system collaboration?

Students within the program can elect to take online courses through other regental schools that fit within the curriculum for this program.

22. Do any related programs exist at any non-Regental college or university within 150 miles of the university?
List those programs here:

No related programs exist at any non-Regental college or university within 150 miles of Northern State University.

Valley City State University has Biology and Chemistry education degrees. They state that you can become certified to teach general science by adding 12 semester hours in each of the other sciences.

University of Jamestown has a degree in biology education.

Dakota Wesleyan offers a degree in biology education.

A. If yes, use IPEDS to identify the enrollment in those programs.

N/A

B. What evidence suggests there is unmet student demand for the proposed program, or that the proposed program would attract students away from the existing program?

N/A with regard to competing with existing programs. Regarding unmet student demand for this program, please see question 17.

Market Demand

This section establishes the market demand for the proposed program (eg Regental system need, institutional need, workforce need). Use the following sources for your data:

- South Dakota Department of Labor & Regulation
- O-Net
- US Department of Labor Projections Central
- SDBOR Workforce and Degree Gap Analysis Report

23. What is the expected growth of the industry or occupation in South Dakota and nationally?
Include the number of openings, as well as the percentage of growth when possible.

This program provides a path to teaching certification in multiple science disciplines through one comprehensive major. As indicated above, this broad education prepares graduates to teach a wide range of science courses at the secondary level, which is especially beneficial in smaller and rural school districts where it is often necessary for teachers to instruct multiple subjects. This degree prepares graduates to meet this demand and increases their marketability when they enter the workforce.

Nationally, approximately 1 in 16 workers (or 6.2%) have occupations in science, engineering or technology, whereas in South Dakota, approximately 1 in 23 workers (or 4.3%) have occupations in science, engineering or technology fields [9]. However, only 16% of U.S. high school seniors are proficient in and/or interested in pursuing a career in science, technology, engineering, and math (STEM) careers [10]. This problem is due in part to minimal preparation and training of teachers at the elementary and secondary levels, and limited exposure of students to STEM fields at an early age. Existing teachers sometimes struggle with time management and content knowledge in dynamic STEM fields, thereby affecting students. It is important to "prepare, recruit, retain, and support" teachers and students to not only increase student proficiency in STEM but also to recruit students into education and/or STEM fields.

The South Dakota Department of Labor and Regulation indicates that the employment need for middle school teachers in South Dakota is projected to grow 6.48% through 2030, and the employment need for high school teachers in South Dakota is projected to grow 6.55% through 2030 [11].

The US Bureau of Labor and Statistics' Occupational Outlook Handbook indicates that the employment need for middle school teachers nationwide is projected to grow 4% through 2031 [12], and the employment need for high school teachers nationwide is projected to grow 5% through 2031 [13]. Both of these growth rates match the average in all occupations.

The US Department of Education's Office of Secondary Education report includes science as an area in which South Dakota has a shortage of qualified teachers in secondary education [14]. This shortage is persistent and has manifested in every year since 2006. Because the nation faces a skills gap in science and mathematics, the South Dakota Department of Education (SDDOE) has identified STEM fields as critical need areas . Post-secondary science educators are challenged with developing curricula that is meaningful for the students and feasible in the classroom. Many middle and high school teachers face similar issues and struggle to generate students' interest in STEM. Quality STEM education therefore is increasingly important to foster student interest and adequately educate/train interested students. This is particularly important when considering perpetually low funding and/or budget cuts that plague many districts. If teachers are trained as researchers and become knowledgeable in current scientific and technological advances in science, they become more confident in their ability to effectively teach scientific content part of the state science standards, which positively influences their students. This has the potential to both increase interest in pursuing careers in STEM fields and augment confidence in students already considering STEM careers.

[9] https://www.bls.gov/oes/current/oessrcst.htm
[10] https://www.whitehouse.gov/sites/default/files/microsites/ostp/stem_stratplan_2013.pdf
[11] The South Dakota Department of Labor and Regulation. Occupational Employment Projections - Long Term. https://www.southdakotaworks.org/vosnet/analyzer/resultsNew.aspx?session=occproj&qlink=1&plang=E
[12] U.S. Bureau of Labor and Statistics. Occupational Employment Handbook. Middle School Teachers. https://www.bls.gov/ooh/education-training-and-library/middle-school-teachers.htm

[13] U.S. Department of Education Office of Secondary Education. Teacher Shortages Nationwide, https://www2.ed.gov/about/offices/list/ope/pol/bteachershortageareasreport201718.pdf, p. 161.
[14] https://doe.sd.gov/oatq/shortageareas.aspx

24. What evidence, if any, suggests there are unfilled openings in South Dakota or nationally?

Middle and high school science teachers are needed in South Dakota, 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 be 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 to rural communities.

With a general search for "science teacher" through K12Jobpsot, over 2,000 positions were identified within the United States. Most of these positions are at private and public schools, or private entities, that require science educators versed in all areas of science.

25. What salaries can program graduates expect to earn in South Dakota and nationally?

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," [15] the median baseline salary of new teachers in South Dakota in Aberdeen, SD is $42,500. According to South Dakota Department of Labor, the median wage estimate for South Dakota middle school teachers is $48,037 and high school teachers is $48,096 (both with a range of $37,793 to $60,902) [16]. Data are not specific to science.

[15] https://doe.sd.gov/data/Teacher-Salary.aspx
[16] https://dlr.sd.gov/lmic/menu_occupational_wages.aspx

26. Optional: Provide any additional evidence of regional demand for the program.
e.g. prospective student interest survey data, letters of support from employers, community needs...

Northern alumni who are teaching in rural schools have asked for the BSED Science, explaining both to their science faculty and education faculty that future teachers would be better served by taking courses across all of the science disciplines.

Student Demand

27. Provide evidence of student completers/graduates at that degree level at peer institutions that offer the same/similar program using data obtained from IPEDS.

Peer Institution: Regional and Competitive institutions. Choose programs not already listed in question 11. Use the most recent year available.

University Name	State	Program Name	Number of Degrees Conferred in Program	Total Number of Conferrals at Level (Undergrad or Grad)
University of Maine Farmingham	ME : Maine	Secondary Education Science	6	6
Midwestern State University Texas	TX : Texas	Secondary Education Science	5	5
University of Wisconsin Superior	WI : Wisconsin	Broad Field Science	30	30

28. What evidence suggests there is interest from prospective students for this program at the university?

There is not broad demand by students to become secondary education teachers, which is part of the reason South Dakota and the nation are experiencing a significant teacher shortage. The BSEd in Science helps students who are interested in secondary education and who want to teach in rural areas. The program gives them a better pathway to a life-long career in education. Between the BSED Biology and BSED Chemistry, nine students are currently enrolled. Offering the BSED Science helps Northern recruit students into secondary education, especially students from rural schools who hope to teach in rural schools. The pathway to what their career will actually look like is clearer with the BSED Science.

Enrollment

29. Are students enrolling in this program expected to be new to the university or redirected from existing programs at the university?

Initially, we expect some students will convert to the BSED Science major from an existing BSED Biology major or BSED Chemistry major. Long term, we expect that this program will attract additional students to NSU. In particular, the program will attract students interested in teaching secondary education in small rural or regional schools as well as students who want to teach science at the secondary level but do not want to specialize in one scientific discipline.

Northern students seeking a BSED in Biology or Chemistry now earn two degrees - BS in their content area (Biology or Chemistry) and a BSED Secondary Education. This same approach 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.

30. Complete the enrollment worksheet to provide an enrollment projection for the next six academic years

Worksheet Completed	Yes

31. What is the minimum number of students required in this program to break even, with respect to the budget?

9 students

32. Discuss the assumptions informing your enrollment estimates.
(e.g. current enrollment and trends in similar programs, IPEDS data, recruitment strategies, partnerships)

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 with a new Secondary Science programs, we started with 8 students with projected growth thereafter. We were conservative in our estimates. Each year we 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. We anticipate growth because we 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.

33. If projected program enrollment is not realized in year two, what actions is the university prepared to take?

The university is committed to science education. We will invest in a marketing campaign to ensure prospective students and their families are aware of this new degree. Advisors as well as admissions will also be “leaned on” to provide information to prospective and current students, again, to ensure awareness of this program.

34. Discuss the marketing and recruitment plan for the program
Include information on partnerships and pipelines (e.g. articulation agreements with BOTE, collaboration with partner university, community partnerships).

The BSEd Science will be marketed through:
- Virtual open houses (advertised online, through emails, and via CAS postcards)
- Faculty one-on-one meeting with prospective students via Zoom, in-person, email
- Communications in the Slate CRM from current students, the dean, and chair.
- Social media platforms

The College of Arts and Sciences will present the program to the School of Education's Advisory Board; area high school counselors; professional academic advisors; and science teachers in the region to share the oportunity for this new degree.

In addition to campus tours and admissions visits, the College of Arts and Sciences will promote the program to prospective students attending campus visit days, Math Contest, and Science Fair.

The Science faculty will engage with the Educators Rising program when high school students considering careers in education visit campus. Working with the Teacher Education program, the Science faculty will add a lab tour to the Educators Rising agenda.

Financial Health

35. Complete the budget worksheet to provide a budget projection for the next six academic years.

Worksheet Completed	Yes

Financial Health Summary						
	1st FYxx	**2nd FYxx**	**3rd FYxx**	**4th FYxx**	**5th FYxx**	**6th FYxx**
Tuition & Fee Revenues	42338	86820	116941	116941	127293	137644
Program Expenses	53012	54364	55716	57068	58420	59772
NET	-10674	32456	61225	59873	68873	77872
Other Supporting Revenues						
NET (Other)	-10674	32456	61225	59873	68873	77872

36.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 and software, other operation and maintenance expenses, facilities, etc., needed to implement the proposed major.
Address off-campus or distance delivery separately.

NSU is not making any new one time or continuing investiments in personanel, instructional techonlogy, 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 and contribute their districts than a biology education or chemistry education program.

NSU has already deeply invested in HyFlex technology and HyFlex teaching faculty training across classrooms and labs in the university. No new investments in classroom or lab technologies or teaching training are needed to support the BSEd Science Education.

37. If new faculty are not requested, describe how existing faculty will be utilized and indicate whether this action will impact other existing programs.

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 science is primarily for additional lab sections that may be needed. Faculty workload in the education program is well managed to maximize efficiences and enrollments. Education Dean and Chair are confident they can manage the students in this program with the workload of one faculty member's course each semester .

38. Is the university requesting or intending to request permission for a new fee or to attach an existing fee to the program?.

Requesting Permission for Fee?	Yes, existing fee
Explanation	Existing fees in science and education courses will be applied to the program to fund the lab materials and support staff for field experiences.

39. Use the table below to describe potential risks to the program's implementation over the next four years.
For each risk, identify the severity (low, medium, high), probability of occurrence (low, medium, high) and the institution's mitigation strategy for each risk.

Risk	Severity	Probability	Mitigation Strategy
Low Enrollment	Medium	High	Provide more science courses that are HyFlex to allow more flexibility and capture a wider student population.
Low Inquiries/Prospective Students	Medium	High	Grow meaningful engagement with students starting in middle school.

External Review

40. If this proposal is for a graduate program, provide information below for at least five potential consultants who may be considered to conduct the external review.

Reviewer Name	Title	Institution
/		
/		
/		
/		
/		

Additional Information

41. (Optional) Use this space to provide pertinent information not requested above that may assist the Board in understanding the proposal.

This program will provide a path to teaching certification in multiple science disciplines through one comprehensive major. The degree will prepare graduates to teach a wide range of science courses in middle school and high school, especially in smaller and rural schools where teachers are expected to be able to teach multiple subjects.

Current secondary science education programs at NSU focus on Biology or Chemistry. Most South Dakota and similar regional schools need teachers that can teach more than one of the sciences. In some of the smaller rural schools, there may only be one science teacher to cover all sciences. Adding this major will allow BS students in Science to move into a BSEd program more easily without having to complete a full major in either biology or chemistry. Students with a broader science credential will be more marketable than students with a single science credential.

What makes this program unique is that the required science courses are aligned with the most recent version of the SD Science Standards for secondary education. Thus, we ensure that the teacher is qualified to teach every topic expected of a secondary science teacher.

Approvals

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	Date
	11/20/2024

Academic Affairs, Provost	Date
	11/20/2024

Finance and Administration, Vice President	Date
	11/7/2024

Veronica Paulson

Enrollment Management, Vice President	Date
	11/20/2024