North Dakota Education Standards and Practices Board
Initial Program Report
Preparation of Composite Science Education Teachers
(05-17)

COVER SHEET

1. **Institution's Name:** Mayville State University
2. **Date Submitted:** December 31, 2025
3. **Preparer of this Report:** Jeff Hovde
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5. **Name of Institution's program:** Composite Science Education B.S.Ed.
6. **Grade levels for which candidates are being prepared:** 5th- 12th Grade
7. **Degree or award level (select one)**
    a. **Initial**
        i. **_X_ Baccalaureate**
        ii. **___ Post Baccalaureate**
8. **Is this program offered at more than one site?**
    a. **___ Yes**
    b. **_X_ No**
9. **If your answer is yes to the above question, list the sites at which the program is offered:**
10. **Program report status (check one):**
    a. **___ Initial Review**
    b. **_X_ Continuing Review**
    c. **___ Focused Visit**

All course syllabi and aligned assessments can be found here: **Composite Science Education BSEd**

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SECTION I: CONTEXTUAL INFORMATION

1. Candidate Information

Directions: Provide three cycles of data on candidates enrolled* in the program and completing** the program, beginning with the most recent academic year for which numbers have been tabulated. Please report the data separately for the levels/tracks (e.g., baccalaureate, post-baccalaureate, alternate routes, master's, doctorate) being addressed in this report.

Program: Composite Science Education B.S.Ed.

Academic Year	# of Candidates Enrolled in the Program	# of Program Completers
2022-2023	3	0
2023-2024	3	1
2024-2025	2	1

* Enrolled candidates are those formally admitted to the program as of the institution's official fall reporting date or as of October 15 of each academic year.
** Program completers are those candidates for whom a degree is conferred within the selected academic year. The academic year begins in the fall and concludes in the spring or summer of the following year depending upon whether candidates are granted degrees in the summer.

2. Curriculum Exhibit (Select 1)

a. X **Option 1:** Complete the Curriculum Exhibit Form below

Curriculum Exhibit Form SFN 14381. *Provides the opportunity for institutions to document the entire program including general studies, teaching specialty, and professional education.*

- *Curriculum exhibit forms are to be prepared for every basic and advanced program being brought forward for either initial or continuing approval by the Education Standards and Practices Board (ESPB).*
- *A separate sheet is to be completed for **each** program for which approval is requested. If more than one program is offered within an approval category, a separate sheet must be completed for each of those programs. For example, if both instrumental and vocal/choral music majors are offered, complete a separate sheet for each. Also, for example, a separate sheet must be completed for each of the science and social science majors.*

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CURRICULUM EXHIBIT FORM BASIC PROGRAM
EDUCATION STANDARDS AND PRACTICES BOARD
SFN 14381 (05-17)

Institution: Mayville State University | **Major**: Composite Science Education B.S.Ed.

Total credits required for degree: 139 credits

General Studies	Teaching Specialty	Professional Education
Credits Required: **30 credits**	Credits Required: **68 credits**	Credits Required: **41 credits**
Communication: 9 credits • COMM 110 Fund of Public Speaking (3) • ENGL 110 College Composition I (3) • ENGL 120 College Composition II (3) OR • ENGL 125 Business & Tech Writing (3) **Computer Information System: 1 credit** • CIS 175 Information Literacy (1) **Humanities and Social Science: 15 credits** • GEOG 103 Multicltrl Wrld, Glbl Issues (3) • PSYC 111 Intro to Psychology (3) • Selected by teacher candidates (9) **Mathematics: 5 credits** • MATH 103 College Algebra (3) • MATH 105 Trigonometry (2) **Science: 8 credits** • Covered from specialty courses	• BIOL 150 General Biology I (3) • BIOL 150L General Biology I Lab (1) • BIOL 151 General Biology II (3) • BIOL 151L General Biology II Lab (1) • BIOL 220 Anatomy & Physiology I (3) • BIOL 220L Anatomy & Physiology I Lab (1) • BIOL 315 Genetics (3) • BIOL 315L Genetics Lab (1) • CHEM 121 General Chemistry (3) • CHEM 121L General Chemistry Lab (1) • CHEM 122 General Chemistry II (3) • CHEM 122L General Chemistry II Lab (1) • CHEM 341 Organic Chemistry I (4) • CHEM 341L Organic Chemistry I Lab (1) • GEOL 115 Introductory Geology (3) • GEOL 115L Introductory Geology Lab (1) • MATH 323 Probability & Statistics (3) • PHYS 110 Introductory Astronomy (3) • PHYS 110L Introductory Astronomy Lab (1) • PHYS 211 College Physics I (3) • PHYS 211L College Physics I Lab (1) • PHYS 212 College Physics II (3) • PHYS 212L College Physics II Lab (1) • SCNC 480 Science Comprehensive (1)	• EDUC 250 Introduction To Education (3) • EDUC 272 Educational Technology (2) • EDUC 290 Theories of Learning & Mgmt (2) • EDUC 380 Teach English Lang Learners (2) • EDUC 381 Human Relations/Cult Diversity (2) • EDUC 390 Special Needs in Inclusive Env (3) • EDUC 400 Student Teaching (10) • EDUC 401 Elctrnc Portfolio/Assess/Semin (2) • EDUC 401S Pre-Student Teach Seminars (1) • EDUC 422 Educational Assessment (2) • EDUC 426 Reading in the Content Area (2) • EDUC 480 General Meth. Sec Educators (3) • EDUC 480L General Methods Field Exp (1) • EDUC 484 Sec. Methods for Science (3) • PSYC 255 Child & Adolescent Psychology (3)

Teacher Candidates select a Biology or Chemistry Specialization:

BIOLOGY (18 credits):
- BIOL 236 Survey of Botany (3)
- BIOL 236L Survey of Botany Lab (1)
- BIOL 312 Vertebrate Zoology (3)
- BIOL 312L Vertebrate Zoology Lab (1)
- BIOL 332 General Ecology (3)
- BIOL 341 Cell & Molecular Biology (3)
- BIOL 341L Cell & Molecular Biology Lab (1)
- BIOL 359 Evolution (3)

CHEMISTRY (18 credits):
- CHEM 330 Quantitative Analysis I (3)
- CHEM 330L Quantitative Analysis I Lab (1)
- CHEM 342 Organic Chemistry II (4)
- CHEM 342L Organic Chemistry II Lab (1)
- CHEM 360 Elements Of Biochemistry (3)
- CHEM 360L Elements Of Biochemistry Lab (1)
- CHEM 470L Integrated Lab (1)
- MATH 165 Calculus I (4)

Total: 30 credits	**Total: 68 credits**	**Total: 41 credits**

3. Descriptive Information about the Program:

Mayville State University's Teacher Education Program is built on the Reflective Experiential Teacher Model, which emphasizes the integration of theory and practice through critical reflection and experiential learning. Accredited by the Council for the Accreditation of Educator Preparation (CAEP) and aligned with InTASC standards, the Composite Science Education BSEd program prepares candidates to demonstrate professional knowledge, skills, and dispositions necessary to positively impact 5–12 learners. Composite Science Education BSEd candidates typically begin the admission process during EDUC 250: Introduction to Education or upon transfer to Mayville State University. Admission requirements include successful completion of foundational coursework (as outlined in the Teacher Education handbook, with minimum grades of "C" or higher), a minimum cumulative GPA of 2.75, competency in basic skills through the Praxis Core Exam, ACT scores, course grades as outlined on the competency menu (currently in pilot phase) or a combination of all three. A course grade of "B" or higher in EDUC 250 is required to be admitted into the Teacher Education program. Composite Science Education BSEd candidates also complete an admission interview, disposition evaluations, submit student liability insurance, and a cleared background check to ensure readiness for clinical experiences that occur through the remainder of the program.

Once admitted, Composite Science Education BSEd candidates progress through a sequence of professional education and methods courses that embed clinical field experiences in diverse settings. These experiences are designed to help candidates apply research-based instructional strategies, develop cultural competence, and integrate technology into teaching. Throughout the program, candidates develop an electronic capstone portfolio aligned to program Student Learning Outcomes (SLOs) and InTASC standards to demonstrate their growth in areas such as learner development, content, instructional practice, and professional responsibility. Professional development seminars and reflective exercises are infused across coursework to support continuous improvement and adaptability in evolving classroom settings.

Admission to the Mayville State Teacher Education Program does not guarantee continuance. Composite Science Education BSEd candidates must maintain a 2.75 GPA, uphold professional dispositions, and receive satisfactory evaluations from faculty and field supervisors throughout their time in the program. They must also earn grades of "C" or higher in all methods and professional education courses. If concerns arise, the Teacher Education Committee may implement a Student Success Plan, probation, or other interventions to support and guide candidates. These measures ensure accountability while supporting candidates' growth within the framework of the Reflective Experiential Teacher Model.

The Composite Science Education BSEd program culminates with the completion of EDUC 400: Student Teaching, a 15-week full-time clinical experience in an accredited school, paired with EDUC 401: Electronic Portfolio and Seminar. In these courses, candidates demonstrate mastery of program outcomes through lesson planning, classroom management, and reflective practice under the guidance of cooperating teachers and university supervisors. Successful completion of student teaching, portfolio presentation, and required Praxis Subject Area and Principles of Learning and Teaching exams ensures candidates are

prepared for licensure and entry into the teaching profession. This progression from foundational coursework to integrated clinical practice reflects Mayville State's mission to prepare educators who are reflective, competent, and committed to lifelong learning.

3. **Changes in the Program since the Last Review:** Please describe any changes since the last review and include rationale for those changes. The following changes have occurred in the program since the last comprehensive review in 2018. A rationale for each decision is provided as well as alignment to CAEP Initial Standards.

#	Change	Rationale	CAEP Alignment
1	The standalone Biology Education and Chemistry Education programs were inactivated in 2020. Then, the EPP developed the Composite Science Education BSEd and began enrolling teacher candidates in 2020.	The program was restructured to better align with state certification requirements, specifically because the Praxis content examination is a general science assessment rather than subject specific (Biology or Chemistry). This composite science approach ensures our graduates are prepared for the broad, interdisciplinary knowledge base required for licensure in North Dakota while also creating a more efficient pathway to degree completion closer to the 120 credit-hour framework.	R1.2
2	In the Fall of 2025, the EPP created two tracks with the Composite Science BSEd degree including one for Biology and one for Chemistry.	We created these two tracks so that students who preferred a more chemistry centered education could have that option. It also allowed students to double major in chemistry more easily.	R1.2
3	Biol 236, Biol 236L, Biol 312, Biol 312L, Biol 315, Biol 315L, Biol 332, Biol 341, Biol 341L, Biol 359, Biol 476s, Math 165 were all removed from the core courses list.	We made two tracks for the composite science major. The following courses: Biol 236, Biol 236L, Biol 312, Biol 312L, Biol 315, Biol 315L, Biol 332, Biol 341, Biol 341L, Biol 359; were all removed from the core courses because they were now only required if a student chose the biology track. Math 165 is only required for the chemistry track and Biology 476s was removed completely in an effort to reduce the number of credits for the program.	R1.2
4	Biol 236, Biol 236L, Biol 312, Biol 312L, Biol 332, Biol 341, Biol 341L, Biol 359 were all added to the biology specialization list.	We created two tracks and felt that these courses belonged only in the biology track.	R1.2
5	Chem 342, Chem 342L, Chem 360, Chem 360L, Chem 330, Chem 330L, Chem 470L, Math 165 were all added to the chemistry specialization list.	We created two tracks and felt that these courses belonged only in the chemistry track.	R1.2
6	SCNC 485 was added to the core courses list.	SCNC 480 and Biol 476s were combined into a new course called SCNC 485. This allowed us to simplify the advising	R1.2

		process as well as to allow for one instructor to teach the course.	
7	EDUC 381 Human Relations and Cultural Diversity course was reduced from 3 credits to 2 credits	The EDUC 381 Human Relations and Cultural Diversity course was reduced from 3 credits to 2 credits to align with North Dakota Century Code and teacher licensure requirements (CHAPTER 15.1-13 Teacher Licensing). Additionally, culturally responsive practices have been intentionally embedded throughout other courses in the program, and this change supports the administration's directive to keep programs as close as possible to the 120-credit minimum for graduation.	R1.2
8	EDUC 401S Pre-Student Teaching Seminar changed from 0 credits to 1 credit.	EDUC 401S Pre-Student Teaching Seminar was changed from 0 credits to 1 credit to accurately reflect the significant workload and assignments required of students. This seminar is essential for preparing teacher candidates for successful student teaching experience, including completing mandatory forms, understanding MSU requirements, reviewing the Model Code of Ethics for Educators, and learning school policies. Assigning 1 credit ensures the course aligns with academic standards and appropriately recognizes the time and effort students invest in the course assignments.	R1.4
9	EDUC 426 Reading in the Content Area changed from 3 credits to 2 credits.	EDUC 426 was reduced from 3 to 2 credits to align with North Dakota licensure requirements.. To strengthen application and avoid redundancy, core reading strategies previously concentrated in this course are now intentionally embedded across multiple content-specific methods courses. This integrated approach ensures candidates learn and apply literacy practices within authentic disciplinary contexts while maintaining compliance with North Dakota Century Code Chapter 15.1-13 and improving program efficiency.	R1.2
10	EDUC 480 General Methods in Secondary Education changed from 4 credits to 3 credits.	EDUC 480 Secondary General Methods was reduced from 4 to 3 credits in response to the administration's directive to streamline programs toward the 120-credit minimum. The course content has been carefully aligned with the North Dakota ESPB secondary education program approval standards and Praxis Principles of Learning and Teaching (PLT) competencies, ensuring that all essential outcomes remain intact. This adjustment maintains rigor and compliance while supporting program efficiency and reducing overall credit load for candidates.	R1.2
11	EDUC 480L General Methods Field Experience was added as a program	EDUC 480L General Methods Field Experience was added to the Composite Science Education BSEd program to provide	R2.3

	requirement.	candidates with additional time in the field to practice instructional strategies. Program data, including feedback from candidates, course instructors, and field mentors, indicated that more applied experience was needed to strengthen classroom readiness. This practicum ensures candidates have meaningful opportunities to implement methods content in authentic settings, improving alignment between coursework and professional practice.	
12	EDUC 398 Secondary Field Experience was removed from the program, and the practicum requirements were moved into EDUC 484 Secondary Methods for Science Education where credits moved from 2 to 3 credits.	EDUC 398 Secondary Field Experience was removed from the program to streamline the practicum and strengthen its connection to instructional methods. The practicum requirements were integrated into EDUC 484 Secondary Methods for Science Education, which increased from 2 to 3 credits. This change allowed the methods instructor to also supervise candidates during their practicum, ensuring consistency in addressing course objectives and program outcomes while providing a more cohesive and contextualized learning experience.	R2.3

4. Field & Clinical Experiences:

Several professional education courses provide Composite Science Education BSEd candidates with school-based practicum experiences under the dual supervision of the responsible University Mentor and selected competent and qualified Field Mentors in 5-12 schools. Clinical Experiences and Student Teaching Experiences are an integral part of the professional education program as they are designed to help our candidates understand the relationship between classroom theory and application to practice. The Director of Student Placement monitors experiences, making sure Composite Science Education BSEd candidates are assigned to multiple settings, which increases the amount and types of diverse 5-12th grade students with which candidates interact. Information on experiences is managed through the Field Placement database to assist in making informed decisions about where to place candidates. It is not likely candidates will be placed in schools in which they have attended to ensure diverse perspectives. Selection for experiences are made balancing factors such as diversity of school, recommendations from district administrators, travel time and distance, school schedule, course schedule, and personal considerations (e.g., disability, socioeconomic status, transportation, family). The table below indicates the early and final clinical experiences our Composite Science Education BSEd candidates participate in and the total number of hours.

Program	Early Field Experiences Observation = (O) Practicum = (P)	Final Clinical Experience (Student Teaching)	Total Hours
Secondary Composite Science Education	EDUC 250 – 25 virtual hours (O) EDUC 480L – 30 hours (P) EDUC 484 – 30 hours (P)	EDUC 400 – 15 weeks full time student teaching in grades 5-12; 600 hours	685

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SECTION II: RESPONSE TO STANDARDS

1. **Areas of Weakness from Prior Review:** How has the program addressed and resolved the weaknesses targeted in the previous program review and not previously resolved? Describe actions taken to address the weakness and provide evidence that the weakness has been resolved.

   Mayville State University no longer offers the Biology Education or Chemistry Education degrees as presented in the last program review (2018). Therefore, the areas "met with weakness" no longer apply. Given zero enrollment in the Composite Chemistry Education program in the three years previous to the last program review and low enrollment in the Composite Biology Education program, a proposal was made by the EPP to the Mayville State Curriculum Committee to inactivate the Chemistry program and redesign the Biology program to meet the requirements of a Composite Science Education degree program that meets standards of ESPB (13047). Factoring into the choice, graduates of both programs were completing the Praxis II: General Science Content Knowledge exam (5435) in order to be licensed across multiple science content areas. This decision was discussed by the Division of Education Faculty, voted upon by the Teacher Education Committee, the Mayville State University Curriculum Committee, and Faculty Association, and approved by the Vice President of Academic Affairs. The revised program took effect under the 2020-2022 academic catalog. Our new Composite Science Education BSEd degree is aligned to the "Composite Science Education" program approval standards as outlined in this review.

2. **Course/Assessment Matrix:**
   - Complete the matrix below.
     - List courses that address each of the ESPB standards for your program. (All courses listed should be linked to an electronic syllabus.)
     - List the assessments that most clearly align with each standard. (Choose from among those listed in Section IV: Evidence of Meeting the Standard.)
   - Provide a short narrative describing how the program addresses the standard. (For example, identify course objectives, activities and related experiences).

All course syllabi and aligned assessments can be found here: **Composite Science Education BSEd**

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SECTION III: ADDRESSING THE STANDARDS

State Standard	Course Prefix and Title	Assessment
13047.1 Composite Science Major/General Science The composite/general science program requires that environmental science be incorporated within other courses or as a separate course. The composite/general science program requires: 1. Coursework in biology, chemistry, physics, and earth science, including: a. Minimum of twenty four semester hours in one area. b. Minimum of twelve semester hours in two other areas. c. Minimum of four semester hours in the fourth area. d. Courses must be from those that the institution allows toward graduation in the science major. 2. Study of mathematics through the pre-calculus level (college algebra and above) and statistics	BIOL 150 General Biology I BIOL 150L General Biology I Lab BIOL 151 General Biology II BIOL 151L General Biology II Lab BIOL 220 Anatomy & Physiology I BIOL 220L Anatomy & Physiology I Lab BIOL 236 Survey of Botany BIOL 236L Survey of Botany Lab BIOL 312 Vertebrate Zoology BIOL 312L Vertebrate Zoology Lab BIOL 315 Genetics BIOL 315L Genetics Lab BIOL 332 General Ecology BIOL 341 Cell & Molecular Biology BIOL 341L Cell & Molecular Biology Lab BIOL 359 Evolution CHEM 121 General Chemistry CHEM 121L General Chemistry Lab CHEM 122 General Chemistry II CHEM 122L General Chemistry II Lab CHEM 330 Quantitative Analysis CHEM 330L Quantitative Analysis Lab CHEM 341 Organic Chemistry I CHEM 341L Organic Chemistry I Lab CHEM 342 Organic Chemistry II CHEM 342L Organic Chemistry II Lab CHEM 360 Elements of Biochemistry CHEM 360L Elements of Biochemistry Lab CHEM 470L Integrated Lab	• Praxis Content Knowledge Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation • EDUC 484 Secondary Science Methods: STOT (InTASC) Evaluation • EDUC 400 Student Teaching-STOT (InTASC) Evaluation • BIOL 476S Comprehensive Exam-last used Spring 2025 • SCNC 480 Science Comprehensive-last used Spring 2025

	GEOL 115 Introductory Geology GEOL 115L Introductory Geology Lab MATH 165 Calculus MATH 323 Probability & Statistics PHYS 110 Introductory Astronomy PHYS 110L Introductory Astronomy Lab PHYS 211 College Physics I PHYS 211L College Physics I Lab PHYS 212 College Physics II PHYS 212L College Physics II Lab SCNC 480 Science Comprehensive	

Narrative: Our Composite Science Education program is built on a strong foundation of coursework across all major science disciplines. To align with state program approval standard 13047.1, the program exceeds state requirements by providing comprehensive study in biology, chemistry, physics, and earth science, complemented by upper level mathematics preparation. Environmental science concepts are integrated throughout courses such as General Ecology (BIOL 332), Survey of Botany (BIOL 236), and Introductory Geology (GEOL 115), ensuring candidates develop a holistic understanding of Earth systems and sustainability.

For the 24 credits in one area, Composite Science Education majors can decide between the Biology track of the Chemistry track. If they select the Biology track, they begin with BIOL 150 (General Biology I) and BIOL 150L (General Biology I Lab), which establish fundamental principles including cell structure, genetics, evolution, and ecology across all three domains of life. These courses emphasize processes such as cellular respiration, photosynthesis, homeostasis, and protein synthesis. This is followed by BIOL 151 (General Biology II) and BIOL 151L, which expand on evolution, ecology, and diversity across all domains of life. The sequence continues with specialized courses: BIOL 220/220L (Anatomy & Physiology I and Lab) provide deep understanding of human biological systems; BIOL 236/236L (Survey of Botany and Lab) cover plant structure, physiology, and ecology; BIOL 312/312L (Vertebrate Zoology and Lab) examines classification and biology of vertebrates with emphasis on structure and field study; BIOL 315/315L (Genetics and Lab) introduce principles from classical Mendelian concepts to contemporary molecular biology; BIOL 332/332L (General Ecology and Lab) explore community dynamics and environmental interactions; BIOL 341/341L (Cell & Molecular Biology and Lab) focus on cellular structure and genetic information flow; and BIOL 359/359L (Evolution and Lab) provides comprehensive analysis of evolutionary theory and evidence. The Biology track culminates with SCNC 480, a comprehensive review course preparing students for their comprehensive exam and capstone presentation.

If Composite Science Education majors decide on a Chemistry track for their 24 credits in one area, their Chemistry coursework begins with the two-semester sequence CHEM 121 (General Chemistry I) and CHEM 121L, covering atomic structure, stoichiometry, bonding, thermochemistry, and molecular geometry, followed by CHEM 122 (General Chemistry II) and CHEM 122L, which continuing with equilibrium, kinetics, and electrochemistry Advanced study continues with CHEM 341/341L (Organic Chemistry I and Lab), which address organic structure, nomenclature, stereochemistry, functional groups, and spectroscopy. Students selecting the chemistry specialization deepen their expertise through additional courses including CHEM 330 (Quantitative Analysis I) and CHEM 330L (Quantitative Analysis I Lab), which cover gravimetric, volumetric, and absorptiometric analysis; CHEM 342 (Organic Chemistry II) and CHEM 342L (Organic Chemistry II Lab), continuing advanced organic topics; and CHEM 360 (Elements of Biochemistry) and CHEM 360L (Elements of Biochemistry Lab), introducing protein structure, enzymes, DNA-RNA, and metabolism. Composite Science Education majors in the Chemistry track also complete CHEM 470L (Integrated Lab), which synthesizes knowledge from multiple chemistry subfields through major projects, as well as SCNC 480, a comprehensive review course preparing students for their comprehensive exam and capstone presentation. SCNC 485 is a combination of the former BIOL 476S and SCNC 480 and will replace these two courses in the next catalog cycle.

Regardless of whether Composite Science Education majors select a Biology or Chemistry track, they will take 12 credits in the other area as the requirement for the 13047.1 Composite Science Major/General Science standard. Also, as part of standard 13047.1, Composite Science Education majors take Physics as their second area of 12 semester credits. Physics instruction begins with PHYS 110/110L (Introductory Astronomy and Lab), an introductory study of the universe including the solar system, stellar evolution, galaxies, and cosmology. This is followed by the algebra-based physics sequence: PHYS 211/211L (College Physics I and Lab) covering motion, energy, properties of matter, and thermodynamics, while PHYS 212/212L (College Physics II and Lab) address waves, sound, electricity, magnetism, light, and optics. Both courses include substantial laboratory components utilizing interfaced probeware and simulation software.

Earth Science meets the “minimum of four semester hours in the fourth area” as part of 13047.1 Composite Science Major/General Science standard. Earth science is addressed through GEOL 115/115L (Introductory Geology and Lab), which cover principles of physical and historical geology including rock and mineral classification, plate tectonics, surface processes, Earth's origin, and the evolution of life. The course includes substantial laboratory and field work, providing hands-on experience with specimen identification and geological processes.

Finally, standard 13047.1 Composite Science Major/General Science requires the study of mathematics through the pre-calculus level and statistics. Mathematics preparation for Composite Science Education majors meets and exceeds the pre-calculus requirement through MATH 165 (Calculus I),

which covers limits, continuity, derivatives, and integration, along with MATH 323 (Probability & Statistics), addressing discrete and continuous probability distributions, the Central Limit Theorem, and hypothesis testing. This mathematical foundation supports the quantitative reasoning required across all science disciplines.

The Composite Science Education program's capstone course, SCNC 480 (Science Comprehensive), integrates learning across all science disciplines. Students review and assess their understanding of science content and complete either original research or literature research, presenting findings through both oral and written communication to the science faculty. The SCNC 480 Science Comprehensive serves as both a course and an assessment, measuring candidates' ability to synthesize and communicate their scientific knowledge. Assessment of this standard also occurs through other measures. The Praxis Content Knowledge Exam evaluates candidates' mastery of science content across all disciplines. Field-based assessments including EDUC 480L (General Methods Field Experience) and EDUC 484 (Secondary Science Methods) evaluate candidates' ability to apply their content knowledge in teaching contexts using the Skills of Teaching Observation Tool (STOT)/InTASC evaluation. Finally, EDUC 400 (Student Teaching) provides comprehensive assessment of candidates' content knowledge application in authentic classroom settings. Together, these assessments demonstrate that candidates have achieved the broad and deep science content knowledge required to teach composite science at the secondary level.

13047.2 Nature of Science The program requires study of the history and philosophy of science as well as the interrelationships among the sciences.	BIOL 151 General Biology II CHEM 122 General Chemistry II GEOL 115 Introductory Geology PHYS 110 Introductory Astronomy	• Praxis Content Knowledge Exam • GPA • SCNC 480 Science Comprehensive-last used Spring 2025

Narrative: Understanding the nature of science (13047.2), that is how scientific knowledge is generated, validated, and interconnected, is essential for science educators. Our Composite Science Education program addresses this standard through carefully selected introductory courses that explore the historical development, philosophical foundations, and interdisciplinary connections within science.

BIOL 151 (General Biology II) introduces students to the history of biology and evolutionary theory, providing context for how biological knowledge has developed over time. The course emphasizes the relationships between structure and function across organisms and explores ecological principles that connect biology to environmental science. CHEM 122 (General Chemistry II) addresses the philosophical underpinnings of chemistry through its exploration of physical states, reaction mechanisms, equilibrium, and thermodynamics, concepts that reveal how chemists understand and predict molecular behavior. The course's coverage of electrochemistry also connects chemistry to physics and practical applications.

GEOL 115 (Introductory Geology) provides both historical and philosophical perspectives through its coverage of the Earth's origin, the history of land masses, and the evolution of life. The course demonstrates how geology integrates concepts from chemistry (rock and mineral composition), physics (plate tectonics and surface processes), and biology (fossil record and evolution), making explicit the interrelationships among sciences. PHYS 110 (Introductory Astronomy) offers a cosmic perspective on science, examining stellar evolution, galaxies, black holes, and big bang cosmology. This course illustrates how physics principles apply across scales from atomic to universal and connects to chemistry through stellar nucleosynthesis.

The Praxis Content Knowledge Exam assesses candidates' understanding of how scientific disciplines connect and inform one another, evaluating their grasp of cross-cutting concepts and the nature of scientific knowledge. Candidates' overall GPA in science coursework serves as an additional indicator of their comprehensive understanding of the nature of science. The SCNC 480 Science Comprehensive requires candidates to demonstrate their understanding of science as an integrated enterprise, showing how concepts from different disciplines interrelate. These assessments collectively ensure that candidates not only know science content but also understand how scientific knowledge is developed, validated, and interconnected across disciplines, essential knowledge for helping students develop authentic scientific literacy.

13047.3 Inquiry The program requires study of the processes of science common to all scientific fields.	BIOL 150 General Biology I BIOL 150L General Biology I Lab CHEM 121 General Chemistry CHEM 121L General Chemistry Lab CHEM 330 Quantitative Analysis CHEM 330L Quantitative Analysis Lab CHEM 342 Organic Chemistry II CHEM 342L Organic Chemistry II Lab CHEM 360 Elements of Biochemistry CHEM 360L Elements of Biochemistry Lab BIOL 151 General Biology II BIOL 312 Vertebrate Zoology GEOL 115 Introductory Geology EDUC 380 Teach English Lang Learners EDUC 422 Educational Assessment EDUC 426 Reading in the Content Area EDUC 480 General Meth. Sec Educators EDUC 480L General Methods Field Exp	• Praxis Content Knowledge Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation

Narrative: In alignment with Standard 13047.3, our Composite Science Education BSEd program develops candidates' understanding and application of inquiry processes through laboratory-intensive science courses and pedagogical coursework focused on inquiry-based instruction. Scientific inquiry, which is the systematic processes through which scientific knowledge is generated, forms the methodological core of science education.

Foundational biology and chemistry courses introduce students to inquiry through hands-on laboratory experiences. BIOL 150 (General Biology I) and BIOL 150L (Lab) emphasize observation, hypothesis testing, and data analysis as students explore cell structure, chemistry, and physiological processes. Similarly, CHEM 121 (General Chemistry I) and CHEM 121L (Lab) engage Composite Science Education majors in experimental design and quantitative measurement while investigating atomic structure, bonding, and chemical reactions. Upper-level chemistry courses deepen inquiry skills through advanced laboratory work. CHEM 330 (Quantitative Analysis I) and CHEM 330L require students to apply gravimetric, volumetric, and absorptiometric techniques, reinforcing precision and accuracy in scientific measurement. CHEM 342 (Organic Chemistry II) and CHEM 342L challenge students to predict and verify organic reaction mechanisms through synthesis and spectroscopy. CHEM 360 (Elements of Biochemistry)

and CHEM 360L integrate molecular-level inquiry as students investigate protein structure, enzyme kinetics, and metabolic pathways using experimental and computational approaches.

Beyond these courses, Composite Science Education majors take BIOL 151 (General Biology II) which emphasizes classification systems and evolutionary relationships that emerge from scientific inquiry, helping students understand how scientists organize and interpret biological diversity through systematic investigation. BIOL 312 (Vertebrate Zoology) engages candidates directly in inquiry through examination of living and fixed specimens, dissections, and required field activities where they practice observational and investigative skills. GEOL 115 (Introductory Geology) provides extensive hands-on inquiry experience through laboratory procedures for rock and mineral identification and required field experiences studying geological processes in authentic contexts.

The pedagogical coursework explicitly addresses inquiry as a teaching approach. EDUC 380 (Teaching English Language Learners) prepares Composite Science Education candidates to use instructional strategies that support language learners in content-based inquiry. EDUC 422 (Educational Assessment) focuses on using formative and summative assessment to evaluate student learning during inquiry activities, teaching candidates how to collect multiple sources of evidence about student thinking. EDUC 426 (Reading in the Content Area) develops candidates' ability to support students' comprehension of scientific texts and use of literacy strategies during inquiry. EDUC 480 (General Methods for Secondary Educators) emphasizes understanding by design, differentiated instruction, and authentic literacy. These skills are all essential for facilitating student inquiry. EDUC 480L (General Methods Field Experience) provides field-based practice where candidates observe and implement inquiry-based lessons under supervision.

The Praxis Content Knowledge Exam assesses candidates' understanding of scientific inquiry processes and their application across disciplines. The EDUC 480L General Methods Field Experience uses the STOT/InTASC evaluation to assess candidates' ability to facilitate inquiry-based learning in classroom settings during their 30-hour practicum placement. This evaluation, completed by candidates, their mentor teachers, and course instructors, measures candidates' developing skills in implementing inquiry-based instruction. Through this combination of laboratory science experiences and pedagogical preparation, candidates develop both firsthand experience with scientific inquiry and the teaching skills necessary to engage secondary students in authentic scientific investigation.

13047.4 Context of Science The program requires the study of the effect of social and technological context on the study of science and on the application and valuing of scientific knowledge. The program prepares candidates to relate science to the daily lives and interests of students and to a larger framework of human endeavor and understanding. The program provides the candidate with an understanding of the relationship of science to industry, business, government, and multicultural aspects of a variety of communities.	CHEM 122 General Chemistry II GEOL 115 Introductory Geology PHYS 110 Introductory Astronomy CHEM 470L Integrated Lab EDUC 484 Sec. Methods for Science	• Praxis Content Knowledge Exam • GPA

Narrative: Science both shapes and is shaped by social, technological, and cultural contexts. Preparing our Composite Science Education candidates to help their students understand these connections is essential for developing scientifically literate citizens who can engage with science-related issues in their communities and lives. Our program addresses this through coursework and experiences that align with Standard 13047.4. In CHEM 122 (General Chemistry II), candidates explore electrochemistry and its applications in batteries, fuel cells, and corrosion prevention, topics that connect chemistry to technology and industry. Discussions of reaction rates and mechanisms highlight links to industrial processes and environmental chemistry, while thermodynamics concepts provide insight into energy policy and sustainability challenges, illustrating how chemical principles inform societal decisions.

GEOL 115 (Introductory Geology) makes these connections explicit by examining resource extraction, natural hazards, and environmental change. Candidates learn how plate tectonics relates to earthquake and volcanic hazard assessment and how surface processes impact land use and water resources, issues with direct implications for communities and government policy. Historical geology, including the evolution of life, encourages reflection on multicultural perspectives and the human story within Earth's history. PHYS 110 (Introductory Astronomy) broadens the context for Composite Science Education candidates by connecting physical principles to humanity's place in the universe. Candidates study how astronomical knowledge developed across cultures and how space exploration technologies influence daily life. Topics such as cosmology and the expanding

universe raise philosophical questions about science's relationship to other ways of knowing, while practical applications like navigation and timekeeping demonstrate science's relevance to everyday life.

Hands-on integration occurs in CHEM 470L (Integrated Lab), where candidates design projects that combine multiple areas of chemistry and apply them to real-world challenges such as environmental testing or industrial processes. This experience reinforces the connections between science, technology, business, and society, preparing future teachers to make those links clear for their students. Finally, EDUC 484 (Secondary Science Methods) brings these ideas into the classroom context. Candidates learn to design instruction that connects science to students' lives, interests, and communities, emphasizing its relationship to industry, government, and global issues. Through case studies, discussions, and lesson planning, they develop strategies to help students appreciate science as a human endeavor embedded in social and cultural contexts.

Assessment through the Praxis Content Knowledge Exam includes evaluation of Composite Science Education candidates' understanding of science in social, technological, and cultural contexts. Candidates' GPA in science courses demonstrates sustained engagement with scientific content that includes these contextual dimensions. These assessments ensure that candidates can help students understand science not merely as abstract knowledge but as a human endeavor embedded in and responsive to social contexts, preparing future citizens to engage thoughtfully with science-related decisions in their communities and personal lives.

13047.5 Skills of Teaching The program requires the candidate to demonstrate proficiency in methods of teaching science.	EDUC 400 Student Teaching EDUC 480L General Methods Field Exp EDUC 484 Sec. Methods for Science	• Praxis Principles of Learning and Teaching Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation • EDUC 484 Secondary Science Methods: STOT (InTASC) Evaluation • EDUC 400 Student Teaching-STOT (InTASC) Evaluation

Narrative: Transforming science content knowledge into effective teaching requires sophisticated pedagogical skills developed through progressive, supervised practice. In alignment with Standard 13047.5, our Composite Science Ed program provides candidates with multiple opportunities to develop and demonstrate proficiency in science teaching methods through carefully sequenced field experiences and specialized methods coursework.

EDUC 480L (General Methods Field Experience) serves as candidates' initial supervised teaching experience, providing a 30-hour placement in a secondary classroom. During this experience, candidates observe expert teachers, examine professional teaching practice, teach at least one lesson, and receive feedback through pre- and post-conferences. This foundational experience allows candidates to apply general pedagogical principles in a science classroom context under close supervision.

EDUC 484 (Secondary Science Methods) provides discipline-specific preparation in science teaching. This course addresses the unique structures, key concepts, and methodologies of science education, including examination of professional standards and expectations. Candidates design and implement lessons that support student learning in college and career-ready science classrooms, incorporating research-based best practices. The course culminates in the creation of a content-specific instructional unit and a philosophy of science education paper, demonstrating candidates' integration of content knowledge, pedagogical knowledge, and personal teaching philosophy.

EDUC 400 (Student Teaching) represents the capstone teaching experience, requiring 15 weeks of full-time supervised teaching in the candidate's major area. Supported by qualified cooperating teachers and university supervisors, candidates are placed in diverse school settings that provide new teaching experiences for professional growth. During student teaching, candidates collect and analyze data on student learning and engagement and attend required seminars through EDUC 401. This intensive experience allows candidates to demonstrate proficiency across all teaching skills in authentic, sustained classroom practice.

Multiple assessments evaluate candidates' developing teaching proficiency. The Praxis Principles of Learning and Teaching Exam assesses knowledge of pedagogical principles essential for effective teaching. The Skills of Teaching Observation Tool (STOT)/InTASC evaluation is administered three times throughout the program: during EDUC 480L as an initial assessment, during EDUC 484 as a mid-program evaluation, and during EDUC 400 as a final summative assessment. This evaluation measures core teaching skills in authentic contexts and tracks growth over time. At each administration point, the evaluation is completed by the candidate (promoting reflection), their mentor or cooperating teacher (providing expert practitioner perspective), and their university supervisor or instructor (ensuring alignment with program standards). This comprehensive, multi-perspective assessment approach ensures candidates develop and demonstrate proficiency in the complex skills required for effective science teaching.

13047.6 Curriculum The program provides candidates with information necessary to identify, evaluate, and apply a coherent, focused science curriculum that is consistent with state and national standards for science education and appropriate for addressing the needs, abilities and interests of students.	EDUC 380 Teach English Lang Learners EDUC 400 Student Teaching EDUC 422 Educational Assessment EDUC 426 Reading in the Content Area EDUC 480 General Meth. Sec Educators EDUC 480L General Methods Field Exp EDUC 484 Sec. Methods for Science	• Praxis Principles of Learning and Teaching Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation • EDUC 484 Secondary Science Methods: STOT (InTASC) Evaluation • EDUC 400 Student Teaching-STOT (InTASC) Evaluation

Narrative: Effective science teaching requires more than strong content knowledge and pedagogical skills. It demands the ability to identify, evaluate, and, apply curriculum that aligns with standards while meeting diverse student needs. Our Composite Science Education BSEd program develops these curriculum competencies through a carefully designed sequence of courses and field experiences aligned with Standard 13047.6.

Candidates begin by learning how to make curriculum accessible for all learners in EDUC 380 (Teaching English Language Learners), where they explore strategies for adapting science content to support language development and ensure equity. This foundation is strengthened in EDUC 422 (Educational Assessment), which teaches candidates to use assessment data to evaluate curriculum effectiveness and make informed decisions about instructional adjustments. Understanding the literacy demands of science is critical for curriculum design, and EDUC 426 (Reading in the Content Area) equips candidates to select appropriate texts and implement strategies that support comprehension of complex scientific ideas. This course emphasizes nonfiction text and evidence-based practices in vocabulary and fluency, ensuring candidates can integrate literacy into science curriculum effectively.

Curriculum design principles come to life in EDUC 480 (General Methods for Secondary Educators), where candidates learn to apply frameworks such as Understanding by Design, differentiated instruction, and universal design for learning. They practice crafting lessons that connect content knowledge with higher-order thinking skills and align with college- and career-ready standards. These concepts are reinforced during EDUC 480L (General Methods Field Experience), which provides authentic classroom observations and opportunities to see how experienced teachers implement and adapt curriculum. Science-specific curriculum development is the focus of EDUC 484 (Secondary Science Methods). Here, candidates examine professional standards and create a complete instructional unit, demonstrating their ability to design coherent, standards-aligned science curriculum. Finally, during EDUC 400 (Student Teaching), candidates implement curriculum over an extended period, collecting and analyzing data to evaluate its effectiveness and make adjustments that meet diverse student needs.

Program-level assessments ensure Composite Science Education candidates master these skills. The Praxis Principles of Learning and Teaching Exam measures their understanding of curriculum principles, while STOT/InTASC evaluations during field experiences (EDUC 480L and EDUC 484) and student teaching (EDUC 400) assess their ability to plan and implement standards-based curriculum in real classrooms. These evaluations track growth from initial understanding to demonstrated proficiency, ensuring graduates are prepared to design and deliver effective science curriculum for all learners.

13047.7 Assessment The program prepares candidates to use a variety of performance assessment strategies to evaluate the intellectual, social, and personal development of the learner in all aspects of science.	EDUC 400 Student Teaching EDUC 422 Educational Assessment EDUC 480 General Meth. Sec Educators EDUC 480L General Methods Field Exp EDUC 484 Sec. Methods for Science PSYC 255 Child & Adolescent Psychology	• Praxis Principles of Learning and Teaching Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation • EDUC 484 Secondary Science Methods: STOT (InTASC) Evaluation • EDUC 400 Student Teaching-STOT (InTASC) Evaluation

Narrative: Assessment is fundamental to effective science teaching because it provides the evidence teachers need to understand student learning and guide instructional decisions. Our Composite Science Education program prepares candidates to use a variety of assessment strategies that evaluate not only content knowledge but also students' intellectual, social, and personal development in science. This aligns directly with Standard 13047.7. Candidates begin building their assessment foundation in PSYC 255 (Child & Adolescent Psychology), where they learn how cognitive, social, and emotional development influences student performance. This understanding helps them design assessments that are developmentally appropriate and equitable for diverse learners.

In EDUC 422 (Educational Assessment), candidates dive deeply into assessment theory and practice, learning to design and implement formative and summative assessments, critique existing tools, and use data to improve instruction. They also explore how technology can support assessment and how to communicate results effectively to students and families. Assessment strategies are reinforced in EDUC 480 (General Methods for Secondary Educators), where candidates practice integrating formative assessment into lesson planning. During EDUC 480L (General Methods Field Experience), they apply these strategies in real classrooms, observing and implementing assessments under the guidance of mentor teachers.

Science-specific assessment practices are emphasized in EDUC 484 (Secondary Science Methods), where candidates learn how to evaluate inquiry skills, lab work, and scientific reasoning, areas that require unique approaches beyond traditional testing. Finally, during EDUC 400 (Student Teaching), candidates demonstrate their ability to collect and analyze data on student learning over an extended period, using assessment results to inform instruction and support growth across all dimensions of science learning.

Program-level assessments ensure candidates meet professional standards. The Praxis Principles of Learning and Teaching Exam measures their understanding of assessment principles, while the STOT/InTASC evaluations, conducted during field experiences and student teaching, document their ability to design and implement effective assessments in authentic classroom settings. These evaluations occur at multiple points in the

program, providing evidence of growth in assessment literacy and practice.Through this combination of coursework, field experiences, and program-level assessments, candidates graduate with the skills to evaluate and support student learning in ways that are meaningful, equitable, and aligned with best practices in science education.

13047.8 Environment for Learning The program prepares candidates to design and manage safe and supportive learning environments in the classroom, laboratory, and field. The program reflects high expectations for the success of all students.	EDUC 250 Introduction To Education EDUC 290 Theories of Learning & Mgmt EDUC 380 Teach English Lang Learners EDUC 381 Human Relations/Cult Diversity EDUC 390 Special Needs in Inclusive Env EDUC 400 Student Teaching EDUC 422 Student Teaching EDUC 426 Reading in the Content Area EDUC 480 General Meth. Sec Educators EDUC 484 Sec. Methods for Science	• Praxis Principles of Learning and Teaching Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation • EDUC 484 Secondary Science Methods: STOT (InTASC) Evaluation • EDUC 400 Student Teaching-STOT (InTASC) Evaluation

Narrative: In alignment with Standard 13047.8, our Composite Science Education program prepares candidates to design and manage learning environments that are both physically safe and emotionally supportive, fostering high expectations for all students across classroom, laboratory, and field settings. Candidates learn that creating safe, supportive learning environments is essential in science education, and this is done as students engage with laboratory equipment, field experiences, and intellectually challenging content.

The foundation begins with EDUC 250 (Introduction to Education), which introduces candidates to the professionalism of teaching and provides initial field experience observing the teaching-learning process and classroom operating procedures. This early exposure helps candidates begin developing their understanding of effective classroom management and learning environments. EDUC 290 (Theories of Learning & Management) focuses specifically on behavior management and creating optimal learning environments through understanding how learning occurs and how to collaborate with learners to support their self-direction and motivation.

EDUC 380 (Teaching English Language Learners) prepares candidates to create supportive environments for language learners, ensuring that linguistic diversity is valued and supported. EDUC 381 (Human Relations/Cultural Diversity) develops candidates' ability to create culturally responsive learning environments that support students from diverse ethnic, racial, socioeconomic, and cultural backgrounds, with particular emphasis on Native American students. EDUC 390 (Special Needs in Inclusive Environments) prepares candidates to create inclusive learning environments that support students with disabilities, teaching them to read IEPs, modify curriculum, and use universal design techniques.

EDUC 422 (Educational Assessment) addresses how assessment practices contribute to supportive learning environments through effective feedback and standards-based communication. EDUC 426 (Reading in the Content Area) prepares candidates to create literate environments where

students can successfully access scientific texts. EDUC 480 (General Methods for Secondary Educators) emphasizes creating content-rich environments that support 21st Century Skills development.

EDUC 484 (Secondary Science Methods) addresses the unique environmental considerations of science teaching, including laboratory safety, field experience management, and creating environments that support scientific inquiry. EDUC 400 (Student Teaching) provides candidates with extended experience managing all aspects of the learning environment, classroom, laboratory, and field, under the guidance of experienced cooperating teachers.

The Praxis Principles of Learning and Teaching Exam assesses candidates' knowledge of learning environment principles. The STOT/InTASC evaluation, administered during EDUC 480L, EDUC 484, and EDUC 400, includes specific indicators addressing learning environment, classroom management, and supporting diverse learners. These evaluations, completed by candidates, their mentor teachers, and university supervisors, provide multiple perspectives on candidates' developing ability to create safe, supportive, and intellectually demanding learning environments. The progression from initial field experience through student teaching documents growth in this essential teaching capacity, ensuring candidates enter the profession prepared to maintain high expectations while supporting all students' success.

13047.9 Professional Practice The program prepares candidates to participate in the professional community, improving practice through their personal actions, education, and development. The program uses varied performance assessments of candidate's understanding and ability to apply that knowledge.	BIOL 236 Survey of Botany BIOL 332 General Ecology EDUC 400 Student Teaching EDUC 401 Elctrnc Portfolio/Assess/Semin EDUC 401S Pre-Student Teach Seminars EDUC 480L General Methods Field Exp EDUC 484 Sec. Methods for Science	• Praxis Principles of Learning and Teaching Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation • EDUC 484 Secondary Science Methods: STOT (InTASC) Evaluation • EDUC 400 Student Teaching-STOT (InTASC) Evaluation • EDUC 401 – Capstone Portfolio: Checkpoint 3 (SLO 2)

Narrative: Teaching is a professional practice that extends beyond classroom instruction to include ongoing learning, collaboration with colleagues, and contributions to the broader educational community. To align to Standard 13047.9, we have aligned our program to cultivate candidates' professional identity and prepares them to participate actively in the professional community from the beginning of their careers.

Professional practice in science education begins with understanding how scientists themselves work as professionals. BIOL 236 (Survey of Botany) and BIOL 332 (General Ecology) both include field activities that model how professional scientists conduct research and collaborate in authentic scientific investigations. These experiences help candidates understand the professional practices they will be helping their students develop.

The professional education sequence explicitly addresses teacher professionalism. EDUC 480L (General Methods Field Experience) introduces candidates to the professional practice of teaching through structured observation and initial teaching experiences, with emphasis on demonstrating professional disposition and modeling ethical practice. Candidates maintain reflective journals, promoting the habit of professional reflection that characterizes expert teachers.

EDUC 484 (Secondary Science Methods) engages candidates with professional standards and expectations specific to science education, helping them understand their future role in the professional science education community. The course's emphasis on research-based best practices and examination of professional literature models ongoing professional learning.

EDUC 401S (Pre-Student Teaching Seminars) explicitly addresses professionalism, covering the Model Code of Ethics for Educators, school policies, and developing professional relationships. This preparation ensures candidates understand professional expectations before entering their student teaching placement. EDUC 401 (Electronic Portfolio/Assessment/Seminar) serves as the program's capstone for professional development. Candidates present their electronic portfolio, demonstrating ability to meet knowledge, skills, and dispositions identified in program Student Learning

Outcomes and InTASC Standards. Professional development seminars throughout the semester provide support, information on focal topics, and opportunities for collegial sharing and discussion, modeling the collaborative professional learning community candidates will join.

EDUC 400 (Student Teaching) provides 15 weeks of full-time professional practice, during which candidates participate in all aspects of the teacher's professional role, including faculty meetings, professional development activities, and collaboration with colleagues. This extended experience allows candidates to develop professional relationships and understand the full scope of teaching as a profession.

Multiple assessments evaluate professional practice. The Praxis Principles of Learning and Teaching Exam includes assessment of professional knowledge and responsibilities. The STOT/InTASC evaluation, administered during EDUC 480L, EDUC 484, and EDUC 400, includes indicators specifically addressing professionalism, collaboration, and ongoing professional learning. The EDUC 401 Capstone Portfolio (Checkpoint 3, SLO 2) provides comprehensive evidence of candidates' professional development across the program, demonstrating their ability to integrate experiences, reflect on practice, and present themselves as emerging professionals. This multi-faceted assessment approach ensures candidates develop both the skills and the professional identity necessary to participate actively in improving educational practice throughout their careers.

13047.10 Technology The program requires the study of current, appropriate instructional technologies. The program uses varied performance assessments of candidates' understanding and abilities to apply that knowledge.	EDUC 272 Educational Technology EDUC 380 Teach English Lang Learners EDUC 400 Student Teaching EDUC 422 Educational Assessment EDUC 480 General Meth. Sec Educators EDUC 480L General Methods Field Exp	• Praxis Principles of Learning and Teaching Exam • EDUC 480L General Methods Field Experience-STOT (InTASC) Evaluation • EDUC 400 Student Teaching-STOT (InTASC) Evaluation

Narrative: Technology has transformed both scientific practice and science education, making technological competency essential for science teachers. Our Composite Science Education candidates know how to use current, appropriate instructional technologies to enhance science learning, integrating technology use throughout both their content preparation and pedagogical coursework.

In alignment with Standard 13047.10, candidates begin their program by taking a sequence of courses including EDUC 272 (Educational Technology) that provides foundational preparation in educational technology, developing background knowledge and training in the use of educational technologies. The course focuses on instructional methods using technologies to support student learning and achievement. Candidates demonstrate developing proficiencies in using educational technologies to create interactive teaching and learning activities. The course is grounded in International Society for Technology in Education Standards (ISTE) and InTASC principles, ensuring alignment with professional standards for technology integration. Further, EDUC 380 (Teaching English Language Learners) addresses technology as a tool for supporting language learners, including assistive technologies and digital resources that make content accessible. EDUC 422 (Educational Assessment) explicitly addresses using technology to support assessment practices, including digital assessment tools, learning management systems, and data analysis platforms that help teachers collect and analyze evidence of student learning.

In, EDUC 480 (General Methods for Secondary Educators) technology implementation is embedded throughout the course and aligns to skills in differentiated instruction while preparing candidates to use digital tools to design and deliver varied instruction that meets diverse learning needs. EDUC 480L (General Methods Field Experience) provides opportunities to observe and implement technology-enhanced instruction in authentic classroom settings. Finally, EDUC 400 (Student Teaching) requires candidates to integrate technology throughout their teaching over an extended period, demonstrating their ability to select and use appropriate technologies to support student learning in science. Candidates work with whatever technologies are available in their placement schools, developing flexibility and resourcefulness in technology integration.

The Praxis Principles of Learning and Teaching Exam assesses candidates' understanding of technology integration principles. The STOT/InTASC evaluation includes indicators specifically addressing technology use, evaluated during EDUC 480L and EDUC 400 field experiences. These observations, completed by candidates, mentor teachers, and university supervisors, assess candidates' ability to select, use, and evaluate instructional technologies effectively. The EDUC 401 Electronic Portfolio itself serves as both an assessment and a demonstration of technology proficiency, as candidates must use digital tools to organize, present, and reflect on their work. This comprehensive approach ensures candidates develop both the skills to use current instructional technologies and the professional judgment to select and implement technologies that genuinely enhance science learning.

SECTION IV: EVIDENCE OF MEETING THE STANDARDS

It is expected that your program makes use of multiple assessments to ensure that all standards are met.. Complete tables **1.A-1.D** described below and provide information requested related to the two-four additional assessments you selected in **2**.

1. Required Assessments:

1. A Praxis II: Content Test: Complete Table 1.A

Praxis Subject Assessment: Composite Science Education Content Exam					
Year	**Content Area Test Name and Number**	**ND Passing Score**	**Total # of Test Takers**	**Average Score**	**Percent Passing**
2022 – 2023	5435	141	0	NA	NA
2023 – 2024	5435	141	1	126	0%
2024 – 2025	5435	141	1	166	100%

1. B Praxis II: PLT (Principles of Learning and Teaching): Complete Table 1.B

Praxis II: Principles of Learning & Teaching					
Year	**Content Area Test Name and Number**	**ND Passing Score**	**Total # of Test Takers**	**Average Score**	**Percent Passing**
2022 – 2023	5624	157	0	NA	NA
2023 – 2024	5624	157	1	151	0%
2024 – 2025	5624	157	1	163	100%

1. C Cumulative GPA at the point of completion: Complete Table 1.C

Cumulative GPA at Completion			
Year	**N** (number of candidates)	**Overall Average GPA**	**Range of GPA**
2022 – 2023	0	NA	NA
2023 – 2024	1	2.99	NA
2024 – 2025	1	3.98	NA

1. D Student Teaching Performance (Clinical Experience) Evaluation

EDUC 400 – InTASC/STOT Evaluation (SLO 2)

Description: The purpose of the Skills of Teaching Observation Tool (STOT)/InTASC evaluation is to measure the core skills teachers should be able to do in today's learning context to ensure students reach their learning goals. The evaluation is used to monitor skill development and growth from the time of admission through completion. This particular iteration was administered during the final semester of the teacher candidates' program, student teaching. The STOT evaluation is completed by the candidate, their student teaching university supervisor, and their cooperating teacher.
Proficiency Scale: Distinguished (4), Proficient (3), Basic (2), Unsatisfactory (1)
Target Score: 3.0

Year	N = # of candidates	Evaluator	Average Score	Target Score
2022-2023	0	Cooperating Teacher	NA	3.00
		University Supervisor	NA	3.00
		Self	NA	3.00
2023-2024	1	Cooperating Teacher	2.5	3.00
		University Supervisor	3.0	3.00
		Self	3.93	3.00
2024-2025	1	Cooperating Teacher	3.29	3.00
		University Supervisor	3.71	3.00
		Self	3.29	3.00

2. Additional Assessments

2a. Pre-student Teaching Practicum Evaluations

EDUC 480L General Methods Field Experience: STOT (InTASC) Evaluation

Description: The purpose of the Skills of Teaching Observation Tool (STOT)/InTASC evaluation is to measure the core skills teachers should be able to do in today's learning context to ensure students reach their learning goals. The evaluation is used to monitor skill development and growth from the time of admission through completion. This particular iteration was administered at the beginning of the teacher candidates' program. The STOT evaluation is completed by the candidate, their mentor teacher, and their course instructor.
Proficiency Scale: Distinguished (4), Proficient (3), Basic (2), Unsatisfactory (1)
Target: 2.5 or higher

Year	N (number of candidates)	Evaluator	Average Score	Target Score
2022 – 2023	1	Instructor	2.5	2.5
		Field Mentor	3.0	2.5
		Self	2.0	2.5
2023 – 2024	0	Instructor	NA	2.5
		Field Mentor	NA	2.5
		Self	NA	2.5
2024 – 2025	3	Instructor	3.40	2.5
		Field Mentor	3.23	2.5
		Self	3.0	2.5

2b. Pre-student Teaching Practicum Evaluations

EDUC 484 Secondary Methods of Science: STOT (InTASC) Evaluation

Description: The purpose of the Skills of Teaching Observation Tool (STOT)/InTASC evaluation is to measure the core skills teachers should be able to do in today's learning context to ensure students reach their learning goals. The evaluation is used to monitor skill development and growth from the time of admission through completion. This particular iteration was administered during the middle of the teacher candidates' program. The STOT evaluation is completed by the candidate, their mentor teacher, and their course instructor.

Proficiency Scale: Distinguished (4), Proficient (3), Basic (2), Unsatisfactory (1)

Target: 2.5 or higher

Year	N (number of candidates)	Evaluator	Average Score	Target Score
2022 – 2023	3	Instructor	3.67	2.5
		Field Mentor	3.0	2.5
		Self	3.5	2.5
2023 – 2024	0	Instructor	NA	2.5
		Field Mentor	NA	2.5
		Self	NA	2.5
2024 – 2025	4	Instructor	3.25	2.5
		Field Mentor	2.86	2.5
		Self	2.73	2.5

2c. Key Performance Task

SCNC 480: Science Comprehensive Presentation Results

Description: In this course, students present the results of either their own research projects or a literature-based research study. They communicate their findings to the science faculty through both oral and written formats. Beginning in Fall 2025, this comprehensive presentation requirement was replaced by SCNC 485, as determined by the Science Education faculty. SCNC 480 was last offered during the 2024–2025 academic year. Because the program's numbers are small, data from this course is aggregated across all science content majors. The Division of Science and Mathematics uses these results to evaluate how well-prepared Mayville State science majors are overall.

Proficiency Scale: An A, B, C, D, F grading scale is used for this course. A =90-100%, B= 80 – 89.9%, C= 70 – 79.9%, D= 60 – 69.9%, F < 60 %.

Target: A grade of a D or better (60% of higher) is considered passing.

Year	N (number of candidates)	Final Grades	Target Grade
2022 – 2023	7	A=5, B=1, C=0, D=0, F=1	>D
2023 – 2024	9	A=4, B=2, C=1, D=1, F=1	>D
2024 – 2025	6	A=4, B=1, C=0, D=1, F=0	>D

2d. Capstone Project

EDUC 401 – Capstone Portfolio: Checkpoint 3 (SLO 2)

Description: The purpose of the Capstone Portfolio is for teacher candidates to demonstrate their ability to meet the knowledge, skills, and dispositions identified in the four program SLOs, as aligned to InTASC Standards (1: Learner and Learning, 2: Content, 3: Instructional Practices, and 4: Professionalism). Teacher candidates integrate technology and experiences with diversity through artifact selection, written rationale, and professional presentation. The portfolio development and presentation support teacher candidates' understanding and application of the Educator Preparation Program's (EPP) conceptual framework, the Reflective Experiential Model. As a requirement for graduation, teacher candidates will create this professional portfolio throughout their teacher education program within their TaskStream account. The final capstone portfolio presentation occurs during the semester teacher candidates are enrolled in EDUC 401-Electronic Portfolio Assessment and Seminar.

Proficiency Scale: Distinguished (4), Proficient (3), Basic (2), Unsatisfactory (1)

Target: 3.0 or higher

Year	N (number of candidates)	Evaluator	Scores	Target Score
2022 – 2023	NA	NA	NA	3.0
2023 – 2024	1	Reconciled	2.50	3.0
		Self	3.25	
2024 – 2025	1	Reconciled	3.63	3.0
		Self	3.75	

2d. Employer survey results related to content knowledge

Supervisor Survey

Description: The Supervisor Survey asks those who supervise first-year teachers, their employers, to assess the novices' readiness for the teaching profession. The survey asks supervisors to assess the quality of completers' instructional practices, abilities to work with diverse learners, abilities to establish positive classroom environments, and levels of professionalism. The survey is administered to direct supervisors of teacher education graduates employed in schools as teachers approximately one year after the completers completed their preparation programs.

Proficiency Scale: Strongly Agree (4), Agree (3), Tend to Disagree (2), Disagree (1)

Target: 3.0 or higher

Year	Supervisor Survey Item (Content)	N = # number of candidates	Average Max= 4 points
2022 – 2023	Effectively teach the subject matter in my licensure area.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	3
2022 – 2023	Design activities where students engage with subject matter from a variety of perspectives.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Help students develop critical thinking processes.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		Question removed	
2022 – 2023	Help students develop skills to solve complex problems.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	3
2022 – 2023	Make interdisciplinary connections among core subjects.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		Question removed	
2022 – 2023	Know where and how to access resources to build global awareness and understanding.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Effectively teach students from culturally and ethnically diverse backgrounds and communities.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Connect core content to students' real-life experiences.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
		Overall Item Average	**3.67**

2e. Graduate survey results related to content knowledge

Transition to Teaching Survey

Description: The Transition to Teaching Survey captures the experiences and perspectives of early-career educators as they navigate their initial years in the profession, providing valuable data on the effectiveness of their preparation programs. This instrument measures new teachers' self-assessment of their preparedness across various teaching competencies, identifying both strengths and gaps in their preparation related to instructional practices, ability to work with diverse learners, ability to establish positive classroom environments, and levels of professionalism.

Proficiency Scale: Strongly Agree (4), Agree (3), Tend to Disagree (2), Disagree (1)

Target: 3.0 or higher

Year	Transition to Teaching Survey Item (Content)	N = # number of candidates	Average Max= 4 points
2022 – 2023	Effectively teach the subject matter in my licensure area.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Design activities where students engage with subject matter from a variety of perspectives.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Help students develop critical thinking processes.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		Question removed	
2022 – 2023	Help students develop skills to solve complex problems.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Make interdisciplinary connections among core subjects.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		Question removed	
2022 – 2023	Know where and how to access resources to build global awareness and understanding.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Effectively teach students from culturally and ethnically diverse backgrounds and communities.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
2022 – 2023	Connect core content to students' real-life experiences.	N/A	N/A
2023 – 2024		N/A	N/A
2024 – 2025		1	4
		Overall Item Average	**4.00**

2 f. Additional assessment of choice

BIOL 476S Comprehensive Exam

Description: This exam is a comprehensive review of all courses within the major field taken to complete the Bachelor of Science in Biology or the Composite Science Education degree. The exam consists of questions which are appropriate to courses taken in completion of the major.

Proficiency Scale: >50% passing, < 50% failing

Target: 50% or above

Year	N (number of candidates)	Average Scores	Target Score
2022 – 2023	7	S=7 U=0	>50%
2023 – 2024	6	S=5 U=0 1 withdrew	>50%
2024 – 2025	10	S=10 U=0	>50%

3. **Respond to the following questions**:

a. Analysis of findings: Describe how the data provided above demonstrate that candidates in the program meet the standards.

Given the sample size of 2 graduates in the last three-year cycle, it is difficult to assess how well the program is meeting the standards. More data will need to be collected over time to give an adequate depiction of how successful the program is at meeting the program approval standards. However, EPP faculty did take the current data and to provide an initial, but limited, view of the program's success.

The data from the Praxis Subject Assessment and Praxis II: Principles of Learning & Teaching exams indicate that Composite Science Education candidates are meeting standards by the end of the program. While no candidates tested in 2022–2023, results from subsequent years show clear improvement. In 2023–2024, one candidate attempted both exams but did not meet the passing score requirements. However, in 2024–2025, a candidate exceeded the North Dakota passing scores on both assessments, achieving an average score of 166 on the Composite Science Education exam (passing score: 141) and 163 on the Principles of Learning & Teaching exam (passing score: 157). This progression demonstrates that the candidate is successfully applying the required content and pedagogical knowledge by program completion.

Cumulative GPA data further supports that candidates meet academic standards. In 2023–2024, the single candidate had a GPA of 2.99, which is near the minimum acceptable level, but by 2024–2025, the GPA increased significantly to 3.98, indicating strong academic achievement. Additionally, course grade data show that candidates consistently earned grades above the target threshold of "D," with most grades being "A" or "B." This trend reflects that candidates not only meet but often exceed expectations in coursework aligned with program standards.

Evaluation scores from cooperating teachers, university supervisors, and self-assessments confirm that candidates demonstrate proficiency in teaching standards during field experiences. In 2023–2024, scores were mixed, with one evaluator rating below the target score of 3.0. However, in 2024–2025, all evaluators reported scores above the target, with cooperating teacher and supervisor ratings averaging between 3.29 and 3.71, and self-assessments consistently above 3.0. Similarly, STOT evaluations during methods courses show growth, with instructor and mentor ratings meeting or exceeding the target of 2.5. These results indicate that candidates develop the necessary instructional skills and professional competencies to meet program and state standards.

b. Response to findings: What changes have you made in your program as a result of data analysis? Provided a rationale for your decision.

Based on the data analysis, one significant change made in the program was the increased emphasis on early intervention and support for candidates struggling with Praxis exams and GPA requirements. In 2023–2024, the data showed that a candidate did not meet passing scores on both Praxis exams and had a cumulative GPA of 2.99, which was near the minimum acceptable level. In response, we are now including Praxis test preparation to our secondary methods course as well as our general methods course to ensure candidates are better prepared for both content and pedagogy assessments.

The rationale for these changes was grounded in the need to improve candidate Praxis pass rates and maintain compliance with standards. The data demonstrated that while candidates eventually met standards by 2024–2025, the initial failure in 2023–2024 highlighted a gap in readiness that could impact program reputation and candidate confidence. By providing structured support earlier in the program, candidates can build stronger foundational knowledge and teaching skills, reducing the likelihood of exam failure and improving overall academic performance. Although data sets as small as this fail to provide a comprehensive view of the program's success, we do believe that these changes are likely to have a positive impact on our students and therefore our program.