Fond du Lac Tribal and Community College
Elementary Education Program

Course Number: _____SP 25 SCI 1285-20_____

Course Title: ___Sci 1285 - Investigative Science II_____

Faculty Name: ____Heidi Ojibway_____

MTC Goal Area: ___3___

Credits: __4__ Pre-requisites: _____ Co-requisites: _____

Successful admittance into the Elementary Education Teacher program required? Yes: ____ No: _X__

Field Experience/Student Teaching? Yes: ___ Number of hours/weeks: _____ No:

Course Description:

This course will provide an exploration of fundamental concepts in physics and Earth/space science through inquiry-based, hands-on exercises including the preparation and proper use of equipment and supplies in Earth science laboratory. Emphasis will be placed on science education principles and connections to state and national science education standards. This course will incorporate the Anishinaabe perspective throughout the course. (Meets MnTC goal area 3).

Recommend Text and/or other Resources (journals, articles, and/or any other additional materials):

- **Integrated Science; Sixth Edition Bill Tillery, Eldon D. Enger and Frederick C Ross; McGraw Hill 2011**
- **Standard Composition notebook (approx. 8 X 10")**

Learning Outcomes

- **Apply the scientific method to laboratory activities, a scientific project based upon a hypothesis, an engineering project; and apply measurements, tools and metric system in laboratory activities.**
- **Describe the basics principals of motion and force and apply basics to laboratory exercises.**
- **Describe and apply the basic principles of energy, heat, light, sound, electricity, and magnetism.**
- **Describe and apply the four sub-division of Earth and Space Science:**
  a. the lithosphere and processes that shape the Earth.
  b. Astronomy-the phenomena of space and extraterrestrial objects
  c. Atmosphere- the phenomena of the atmosphere and weather
  d. Hydrosphere – the water on the Earth

- **Identify examples of indigenous Earth System and Space Scientific phenomena**
- **Interpret information provided in maps, such as contour, Mercator, etc. and the importance of other types of scientific models to help study science**

Cultural Standards:

*Each course within the BS in Elementary Education program must meet a minimum of two measurable learning outcomes for three different **Cultural Standards**. If your course does not meet the Cultural Standards, please justify your rationale.*

Cultural Standard (must meet 3 of 7)	**Learning Outcomes that Align to Cultural Standards** (two for each standard) The student will:	**Cultural Assessment Description**
1. GIKENDAASOWIN – Knowing Knowledge To prepare our teacher candidates to be problem solvers who strive for continuous learning and growth. Disposition: Integrates Content and Pedagogical Knowledge Teacher candidates demonstrate their ability to integrate content and pedagogical knowledge by weaving the following into their teaching: • *Technology:* Use technology effectively to improve student learning. • *Theory to Practice*: Applies current theory, research, and best practices to improve one's professional practice as a teacher. • *Critical and Connected Thinking*: Engages in critical thinking that reflects analysis, problem solving, and incorporates world views and community knowledge to create culturally relevant instruction. • *Reflective Practice:* Demonstrates self-reflection and incorporates professional feedback to adjust for continuous improvement in professional practices and effective instruction. Professional Outcome: Content and Pedagogical Knowledge To develop teachers who value and utilize knowledge, learning, and critical thinking that is central to Indigenous and other ways of knowing.	Describe the basics principals of motion and force and apply basics to laboratory exercises. Describe and apply the basic principles of energy, heat, light, sound, electricity, and magnetism.	Research and share indigenous peoples' creation stories including the Ojibwe Creation Story when students study the Big Bang Theory of the creation of the universe. How do legends or history of the creation of the universe surround traditions of the people who pass them from generation to generation. Research and share Native American Constellation while studying the life cycles of stars. How do constellations express the people, the legends/history and the Traditions? Research and share ancient cultures and indigenous peoples' understanding Aurora Borealis while students are studying the layers of the atmosphere.
2. GWAYAKWAADIZIWIN – Living a Balanced Way To provide teacher candidates the opportunity to recognize the importance of living in harmony with the community and are prepared to use a collective approach to understanding and deciding on a course of action.	Describe and apply the four sub-division of Earth and Space Science: a. the lithosphere and processes that shape the Earth.	Research and write about the good stewardship of water to protect wild rice and how growing condition can be affected by human interference

Disposition: Communication and Collaboration Teacher candidates demonstrate professional, interpersonal, and communication skills. These skills are used to promote positive collaborative partnerships with students, families, colleagues, other school professionals, and the global community to support achievement of student learning outcomes. • *Reflective Collaboration*: Uses insights and inspiration of others to improve practice and can occur in: ○ Professional Learning Communities ○ Mentoring Programs ○ Peer Observations ○ Critical Friends Groups • *Community Involvement*: Demonstrates positive collaborative skills in interactions with instructors, advisors, students, colleagues, parents/guardians/caregivers, school teams, and those in the wider community. • *Communication*: Effectively and accurately communicates ideas, thoughts or visions (oral and written) and engages in active listening based on audience and community cultural norms. Professional Outcome: Community and Collaboration To develop teachers who are reflective, connected educators who understand the interrelatedness of educating the whole child by including the community.	b. Astronomy-the phenomena of space and extraterrestrial objects c. Atmosphere- the phenomena of the atmosphere and weather d. Hydrosphere – the water on the Earth Interpret information provided in maps, such as contour, Mercator, etc. and the importance of other types of scientific models to help study science	with how the FDL Tribal Environmental Office monitors and ensures water quality. Reading and interpreting maps and contour maps and then research and construct moon phases, Ojibwe moons to demonstrate to students the importance and construction of scientific models. This project reinforces the information learned on the types of models in science and asks students to create a physical model to show their understanding of the importance of physical models.
4. AANGWAAMIZIWIN – Diligence and Caution To develop teacher candidates' capacity to proceed carefully, after identifying, discussing and reflecting on logical and ethical dimensions of political, cultural, social, and personal life. Disposition: Ethical Behavior Teacher candidates demonstrate professional integrity through behaviors and actions that reflect state and FDLTCC ethical and cultural standards. • Demonstrate professional and ethical conduct with faculty, faculty supervisors, cooperating teachers, students, parents, colleagues, and community. • Practices, complies, and understands the school site and the college and unit policies (e.g., academic honesty), as well as Minnesota Code of Ethics for Teachers. • Adheres to all professional standards, including the use of technologies (e.g., accesses authorized websites, social media and other applications, and uses personal electronic devises as appropriate). Professional Outcome: Ethical Practitioner • To develop teachers' capacity to be ethically responsive in respecting their role as an educator and understanding community needs.	Identify examples of indigenous Earth System and Space Scientific phenomena Apply the scientific method to laboratory activities, a scientific project based upon a hypothesis, an engineering project; and apply measurements, tools and metric system in laboratory activities.	Share your experience with the sugar bush-the spring camp. Interview an elder of your tribe or family that makes maple syrup in the traditional way. Discuss what is the traditional way to make maple syrup. Understand the stewardship that is essential to continue the production of maple sugar. Complete an engineering project based upon an Anishinaabe object or process. This project is to give students practice at using the basic elements of an engineering project, including, but not limited to identifying the scientific or social importance of project topic, researching

		project topic, creating a prototype, researching and identifying ways to improve prototype, improving prototype and reporting project to others for review.

Minnesota Professional Education License and Standards Board Standards (MN PELSB)** listed at the end of the syllabus. (Insert more rows as needed.)

8710.2000 Standards of Effective Practice

MN PELSB SEP Standard Code	*8710.2000 Standards of Effective Practice*	Learning Opportunities & Assessment *Include the Field Experience hours as applicable for clarity.	Based on the learning opportunities and assessments, the K-6 learner will demonstrate meeting this standard by:	FDLTCC Learning Outcomes	Cultural Standard
J.2.C	use appropriate scientific instrumentation and equipment and mathematics as tools to improve scientific investigations and communications	Students will be assessed on the following practice of science activities throughout the semester: Chapter 1-Week 1: The process and art of science and scientific study Week 2-Penny Lab Week 1-9: engineering project Week 1-16: scientific method project based upon a scientific problem and question. Weekly quiz week 2 and 3	Demonstrate the ability to use scientific instrumentation, equipment, mathematics and graphing tools to improve scientific investigations and Communications. Students will be given the opportunity to investigate and then perform scientific investigations through a science project based upon a problem and hypothesis and an engineering project completed through the basic engineering project goals. In both cases, students must collect data through equipment and instrumentation to	Apply the scientific method to laboratory activities, a scientific project based upon a hypothesis, an engineering project; and apply measurements, tools and metric system in laboratory activities.	AANGWA AMIZIWIN Diligence and caution

			support their scientific and engineering Conclusions. The penny lab is a group practice that provides scientific investigation and communication of the full scientific method process, including data collection and a laboratory write up sharing their conclusions based upon data. This is designed to allow students the opportunity to complete a project before they are required to complete a project of their own. The engineering project gives students the opportunity to test a prototype they have created upon the engineering design process. Testing includes collecting data on how closely the prototype follows the researched design Process. Weekly quizzes will test students' knowledge of the equipment and properties used to collect data in a scientific project and an engineering project that includes mathematics to include, but not limited to, tools and equipment to measure mass, volume, temperature, density, speed, force, and length.		

J.2.E	evaluate alternative explanations and models based on evidence, current scientific understanding, and logic	Students will be assessed on the following practice of science and technology to help evaluate evidence and scientific understanding: Week 1: Phases of the moon physical model Week 2: Penny Lab Week 1-8: engineering and technology project Week 1-16: Scientific project Chapter 1 Week 1 on the process and art of scientific study Weekly quizzes week 2 and 3	Demonstrate the ability to evaluate models based on evidence, current scientific understanding and logic. After studying the different types of scientific models used in science to understand the world around us, students will be assessed on their ability to create a physical model on the phases of the moon. Students will research the phases of the moon and different ways in which to present a physical model that describes the relationships between the Sun, Earth and Moon as it relates to phases. Students are expected to share the models with the student colleagues for comparison of how alternative ways of creating a physical model can relay and understanding of the Phenomena. For the engineering project students are expected to complete a project following engineering design processes including researching how to create a prototype, testing their prototype and then looking for alternate information to improve upon the prototype. For the science project based upon a problem	Apply the scientific method to laboratory activities, a scientific project based upon a hypothesis, an engineering project; and apply measurements, tools and metric system in laboratory Activities. Interpret information provided in maps, such as contour, Mercator, etc. and the importance of other types of scientific models to help study science Identify examples of indigenous Earth System and Space Scientific Phenomena.	GWAYA KWAADI ZIWIN Living a balance way

			and hypothesis, students are expected to research and evaluate their problem to determine current and alternative scientific evidence to help them establish and test the hypothesis. Students are expected to share their project upon completion to model the importance of peer review in the scientific process. The purpose of the penny lab is to allow students the ability to work as a group to start and complete a scientific problem based upon a testable hypothesis. Students will be assessed in their lab activities and weekly quizzes assessing the ability to understand the engineering design process, the scientific method and the importance and use of scientific models in science as they related to students researching and investigating current literature on and alternative ideas that help people understand scientific phenomena in the world around them.		
J.2.f	communicate and defend a scientific argument	Students will be assessed on their ability to defend a scientific argument by completing a scientific study of a scientific problem throughout the semester and presenting it in Week 16 for peer review. Peer review is an important part of current	Communicate and defend their scientific project based upon a scientific problem and hypothesis and the importance of peer review in excepting a scientific study as being Valid.	Apply the scientific method to laboratory activities, a scientific project based upon a hypothesis, an	AANGWAAMIZIWIN Diligence and caution

		scientific acceptance and validity of theories and laws. Peer review is the process by which scientists share their entire project with the scientific community to be evaluated for proper data collection, ethical experimental design, and conclusions based solely upon experimental evidence. Students are expected to share their entire project with their student colleagues for their review.	Students will be learning throughout the semester how current theories and laws of science were rooted in experimental study that was shared with the scientific community to be accepted as valid or not. Students are expected to complete a full scientific study following the scientific method and finally sharing and defending their project's hypothesis, data and conclusion so student peers can review their project.	engineering project; and apply measurements, tools and metric system in laboratory activities	
J.5	know and apply the fundamental concepts and principles of physical science concerning properties of and changes in matter; position, motion, and force; light, heat, electricity, and magnetism; and kinds of and ways to transfer energy.	Students will be assessed through laboratory work, assignments and weekly quizzes for weeks 3-7 and the focus of basic physics concepts including but not limited to: Chapter 2 Week 1-2: matter, position, motion, force. Speed Lab Groundhog Day: Native American and nature to predict seasons and weather. Phet Lab on Motion and Force Chapter 3 & 4-Week 3: energy and thermodynamics. Heat lab Chapter 5-7-Week 4: wave motion and sound, electricity and magnetism and light Static electricity lab	Demonstrate knowledge and the ability to apply basic concepts of physics ranging from kinematics, energy, thermodynamics, wave motion and electricity and magnetism. The speed lab will be assessing students understanding of how distance and time data collected can be used to calculate average speed. The purpose of asking students to research and share Native American and indigenous people's natural observations help to predict conditions around them and how this is different from the lore of Groundhog Day. The Phet force lab is designed to assess students' understanding of the factors that	Apply the scientific method to laboratory activities, a scientific project based upon a hypothesis, an engineering project; and apply measurements, tools and metric system in laboratory activities. Describe the basics principals of motion and force and apply basics to laboratory exercises. Describe and apply the basic principles of	GIKENDA ASOWIN Knowing knowledge

		Weekly quizzes weeks 4-9	affects net force, including but not limited to, vertical motion, horizontal motion, applied force and frictional forces. In addition, how does mass and acceleration affect the net force. The purpose of the heat lab is for students to physically observe two common heat transfer that have implications in all sciences. Students will apply and perform an experiment testing conduction and convection heat transfer systems. The purpose of the electrostatic lab is for students physically observe what happens when static electricity takes place on objects and in this case, it is with cellophane tape. Through experimentation and observation, students have to determine which pieces of tape they are experimenting with have picked up extra electrons and are negatively charged or have had electrons stripped away and are positively charged. Static electricity is a basic theme in electricity to observe the flow of electrons. Weekly quizzes throughout this time	energy, heat, light, sound, electricity, and magnetism. Identify examples of indigenous Earth System and Space Scientific phenomena	

			periods assess students understanding of the major physics concepts, formulas for calculating physical phenomena and their ability to apply concepts they have learned.		
J.7.	know and apply the fundamental concepts and principles of earth and space science concerning properties of earth materials; objects in the sky; changes in earth and sky; structure of the earth system, including hydrosphere, biosphere, atmosphere, and lithosphere; history of the earth; and earth in the solar system	Students will be assessed through laboratory work, assignments and weekly quizzes for weeks 8-16 on basic earth and space science concepts including but not limited to: Chapter 12 - 14-Week 5-6: The universe and the earth as a planet. Big Bang Lab Activity HR diagram lab Native American constellation activity NOVA: Secrets of the Sun Activity.	Demonstrate and apply fundamental concepts of basic Earth and Space Science concepts from the universe to all spheres of planet Earth. The Earth and space science unit is an investigation of the hydrosphere, lithosphere, atmosphere and astronomy and how studying these sections of the science helps to understand how the biosphere is affected by the multisystemic Interactions. Weeks 5-6 give students previous and current theories and laws into the phenomena of space, including but not limited to, the Earth as seen from space, formation of the universe theories and the currently accepted theory of the big bang, stellar life cycles, planet comparison of size, mass, atmospheres, physical characteristics, revolution and rotation times. Students learn the science behind the geocentric and heliocentric models of galaxies and how science was controlled	Describe and apply the four sub-division of Earth and Space Science: a. the lithosphere and processes that shape the Earth. b. Astronomy- the phenomena of space and extraterrestrial objects c. Atmosphere- the phenomena of the atmosphere and weather d. Hydrosphere – the water on the Earth Identify examples of indigenous Earth System and Space Scientific phenomena	AANGWAAMIZIWIN Diligence and Caution GIKENDAASOWIN Knowing knowledge GWAYAKWAADIZIWIN Living a balanced way

			by the church which did not always consider the data that helped to support more scientific reasoning. Students also learn the important aspects of the Earth-Moon relationship and how its gravitational attraction has far reaching consequences on our planet. The big bang lab helps students observe how celestial objects move away from each other at a measured pace to help support the currently accepted theory, An investigation into Native American and indigenous peoples' legends into the formation of the world as they know it allows students the opportunity to appreciate alternative ideas that have been created through history and how the tribal traditions influence the legends. In class discussion, students compare their indigenous stores to look for common themes. Students apply this knowledge to an HR diagram which is a graphical representation showing how mass and temperature influence the size of star and consequently the life cycle trek they make. The HR diagram also helps students identify		

		Chapters 15-16- Week 7-9 the composition of the earth and its interior; rocks, minerals and rock cycle; formation of landforms. Interactive notebook activities on earth's interior, plate boundaries, rock categories Pangea lab Sedimentary rock lab	stars, such as our sun, where they are in their life cycle. For instance, our sun is a main sequence star which means it is halfway through its stellar life Cycle. "NOVA secrets of the sun" is a video account of how NASA observes and collects data on our sun using various types of telescopes and other astronomical instrumentation. The video goes into detail how the solar activity such as flares and prominences have a huge effect on our Earth and our magnetic field. The data collection NASA gathers is to aid in determining how protected the Earth's power grid system is. Students are taught about the lithosphere of planet Earth. Studies in this section include but are not limited to, composition of the Earth, previous and currently accepted theories of lithospheric formation and changes, plate tectonics, the rock cycle, rock formation and constant changes. This unit also includes the consequences of plate movement in the study of volcanology and seismology. Plate movement governs the formation of the		

		Chapter 17-Week 11 and 12: atmosphere. Interactive notebook atmosphere levels	landforms that can be observed on Earth. The Pangea lab allows students to observe the theories of how the Earth's continental lithosphere was once one continent through millions of years of plate activity has changed into what it is today. This lab helps students understand why the current continents have the shape they do where continents look as those they may have been attached. In addition, this lab helps to show how fossils found on the separate continents further proves they were at one time together, The sedimentary rock lab is an observation and data collection lab that allows students to visualize how sedimentary rock formation is all at the surface of the Earth. This lab also helps students to understand the ever-changing surface of the earth and the connection between the other earth science spheres of student interact. For example, the influence of the hydrosphere works to weather, erode and perform deposition of material on the surface of the Earth.		

		Northern Lights Native American Discussion Sugar Bush and Elder interview project.	The interactive notebook supplements help guide students through the concepts that are difficult to be tested in a classroom setting. Plate tectonic activity is observed through phenomena such as earthquakes and volcanoes, the Earth's interior has also been discovered through seismic activity. This section of Earth science deals directly with the atmosphere composition, layers, global and service winds, weather and climate and how scientist collect data to understand this part of earth and space and how they affect each other and the life that lives on this planet (biosphere). Students learn about factors and tools that help to predict weather on our planet to include, but not limited to, pressure (barometer), wind patterns (anemometers and vanes), precipitation levels (water collection methods) and temperature (thermometers). Students learn how global and surface winds can affect the climate in regions of the Earth. Global wind study feathers in the important heat transfer		

		Chapter 18: Weeks 13 and 14: water; and Individual Water usage and	of convection and how different latitudes of the earth all interact. The interactive notebook activity on the atmospheres breaks the atmospheres into its layers based upon temperature and pressure and further give graphic representation detail of what each layer of the atmospheres function is and what scientists have discovered through observation and data collection through the years and the advancement of technology allows. Another important interaction between two studies of Earth and space science is the Aurora borealis and australis. Current theories report the interactions of the sun's activity on the ionosphere of our atmosphere which allow scientists to further study the importance of the sun's activity on our magnetic field. The Native American northern lights discussion assignment is designed for students to research how indigenous cultures may have tried to understand the phenomena of the northern lights to people who did not currently have		

		conservation lab Wild Rice Discussion/Paper	technology and research to explain what is really occurring and some common lore people used to govern their traditions. The sugar bush activity is to help students understand how climate influences when the fluids run through a maple tree to the tops of the tree to help to remove the tree from a hibernation status. The elder interview is designed to include the important traditions and information the elders of the tribe must know when it is time to tap, how to tap the tree responsibly, how to collect and prepare the liquid into maple syrup. This is an important project to help students understand the years of observation and process implementation help to guide future Generations. The final sphere to study is the hydrosphere of our planet. This study includes where is the water at any given time on our planet. What water is fresh and useable, and which is not because it is salt water, or it is polluted from human interactions and activities that harm our water. This unit also studies the importance of the water cycle and		

		Weekly quizzes week 9-15 Week 15 PPT and class discussion-future environmental challenges	how it is supposed to function to keep water moving on the Earth. The water cycle is also useful to show where stages of this cycle can be greatly harmed and influenced by human activities of industry, farming, and recreation. The purpose of the wild rice project is to give students an understanding of how the sacred food the Anishinaabe interacts with the hydrosphere and biosphere. Research is conducted into how the rice grows and how water conditions influence the sustainability of this sacred crop. Research also includes what environmental factors can endanger the wild rice population. In addition, how is the FDL reservation environmental department important to the monitoring of the lakes and water where the rice grows. What data collection methods and tools are used to monitor the health of the wild rice waters. The conservation lab requires application of knowledge. Students are required to keep a detailed record of their water usage throughout a weekly period. This lab further allows		

			students to see the enormity of water used by one individual in a weeks' time and to relate that to the seven billion people on our planet. Finally, the last important portion of this lab is to find ways to reduce water consumption to keep water a sustainable natural resource. Weekly quizzes throughout this time frame assess students understanding of the Earth/space concepts they have learned. Students are assessed on their understanding of each separate study in the field of Earth and space science, tools and technology used to collect data in each system, current theories and laws that govern understanding of each of the systems and how they interact and interrelate to each other and the biosphere. Finally, students are assessed on their ability to apply concepts to real-life. Is a study into the current theories of how each of the earth/space science systems are fairing human interactions and interferences and methods that are being researched and tried to		

8710.3200 Elementary Education: Subject Matter:

Subpart 3. **Standard 2, student learning.** A teacher must understand how students learn and develop and must provide learning opportunities that support a student's intellectual, social, and personal development. The teacher must:

MN PELSB Content Standard code	*8710.3200 Elementary Education: Subject Matter*	Learning opportunities and Assessment *Include the Field Experience hours as applicable for clarity.	Based on the learning opportunities and assessments, the K-6 learner will demonstrate meeting this standard by:	FDLTCC Learning Outcomes	Cultural Standard

Course Requirements & Assessment descriptions:

Criteria	Points	Due

Course Schedule:

Week	Class Activity - Topic	Assignment Due
Week 1 1/12 and 1/14	Introductions Scientific method Graphing scientific data Scientific models Scientific equipment	Weekly class discussion-introductions Chapter 1 Moon phases and Ojibwe moon cycles model assignment Interactive notebook-science equipment

		No weekly quiz
Week 2 1/19 & 1/21	Complete Scientific method introduction Assign Science Project	Chapter 2 Weekly discussion Lab Assignment-Penny Lab Assignment (scientific method and graphing) Weekly Quiz
Week 3 1/26 & 1/28	Intro to physics Speed, velocity and acceleration Vectors-Newton's Law of motion Momentum	Weekly discussion Chapter 3 and 4 Speed Lab Vectors, adding vectors assignment Phet Lab on Motion Phet Lab on Force and Friction Momentum lab Weekly Quiz
Week 4 2/2 & 2/4	Energy Thermodynamics	Weekly discussion-groundhog's day, Native American signs of the weather and seasons. Chapter 5-7 Interactive notebook-heat Heat Lab Interactive notebook - Energy Weekly Quiz
Week 5 2/9 & 2/11	Waves, Light, Sound Electricity and Magnetism	Weekly Discussion Read Chapter 12 Interactive Notebook-Waves Sugar Bush Assignment Static electricity Lab Heat transfer and wave lab Weekly Quiz
Week 6 2/16 & 2/18	Our Earth in Space-Big Bang Theory Space technology Star Formation and Life Cycle	Read chapter 13 and 14 "Big Bang Lab Activity" Discussion: "An Anishinaabe Creation Story" Native American Constellation Essay Weekly Quiz
Week 7 2/23 & 2/25	Earth and the planets characteristics The moon, tides, seasons and eclipses	Read chapter 15 Discussion: the importance of seasons for native peoples H-R Diagram Weekly Quiz
Week 8	Earth's structure from top to	Read Chapter 16

3/2 & 3/4	center. Continental drift theory Seafloor spreading theory Plate tectonics and some other theories… Landforms from plate boundary movement	Discussion Pangea Lab A Native American constellation Interactive notebook Earth's insides Plate boundary movement lab
Week 9 3/9 & 3/11	Rock Cycle, minerals and rocks. Scientific notebook and the rock cycle Mountain building	Read chapter 17 Discussion Sedimentary Rock Lab Engineering project due Midterm
Week 10 3/16 & 3/18	Spring Break	
Week 11 3/23 & 3/25	Earth's Atmosphere Surface, global and local winds Weather patterns and systems	Read chapter 18 Understanding the phenomena of the Aurora Borealis in cultures Weekly quiz
Week 12 3/30 & 4/1	Finish up weather patterns	Read Chapter 19 Discussion Global wind systems lab Sugar Bush Elder Interview
Week 13 4/6 & 4/8	Forms of water on the planet Water cycle Currents and salinity patterns	Chapter 20 Discussion Individual water usage Lab Weekly Quiz
Week 14 4/13 & 4/15	Water in Minnesota Water requirements for Wild Rice	Preserving wild rice lakes discussion Wild rice project Weekly Quiz
Week 15 4/27 & 4/29	Surface, global and local winds Climate	Weekly discussion "Global Wind systems" Weekly Quiz
Week 16 5/4	Changes to save our planet Different sources of fuel	Weekly discussion Lab Scientific Investigation Due Weekly Quiz
Final Exam Week 5/5-5/11	Final Exam Week	Final Exam

Requirements and Points:

Course Assignments:

Each week you will be given a new reading assignment, lab, quiz and discussion post. The reading assignment will be assigned one or more week(s) before the material is discussed in class so students will have prior knowledge of what will be discussed in class. Students are expected to ask questions when they do not understand the material they are being requested to read. Reading material will be assessed in weekly online quizzes, midterms and final exams.

Laboratory assignments (10 points each) will be given to students to be conducted outside of the classroom. When labs are conducted outside of classwork, students will be given class time to complete these labs. Laboratory assignments will be posted online for you to either print off or make a copy. Lab assignments will be accepted in class or via D2L on or before the due date. During the weeks there are no outside class lab assignments, we will be working on a scientific notebook that will be handed in at its completion.

An end-of-quarter scientific project will be assigned at the beginning of the semester and will be due at the end of the course. This will be like a school science fair project so that you have experience conducting a project you may assign as an elementary teacher. This will give you the skills to help a student with their own project.

An engineering project will be assigned at the beginning of the quarter and will be due at midterm.

A small research paper and elder interview assignment (30 points each) will be assigned throughout the semester to meet the cultural requirements addressed above. Assignments will be accepted in class or via D2L on or before the due date.

Weekly Quizzes, Midterm and Final:

Weekly 10-point quizzes will be posted on D2L and will be due on or before the due date. Students will be given one hour to complete the quiz.

A 100-point (each) midterm and final exam will be assigned on D2L. Students will be given two hours of class time to complete each exam.

Weekly Participation:

Students will be given a weekly discussion topic on the Monday of the week pertaining to the weekly classroom topic. Students will be expected to post one original discussion post each week by 1159 pm the Thursday of the week and reply to a minimum of one other classmate's original posts on or before Sunday 1159 pm.

Due Dates and handing in work: Students are expected to hand in their work on or before due dates either by submitting them to D2L or via email (sue.tracy@fdltcc.edu). Please plan ahead and make sure you give yourself enough time to get everything done.

Late work: any assignment that is turned in after the due date/due time will be considered late.

One day late: 10% off earned score

Two days late: 20% off earned score

Three or more days late: no points earned

We are all busy and life happens to us all, so if you have a situation come up where you need extra time, it is your responsibility to contact me to work out an arrangement.

To meet the program requirements, students must pass the course with 70% or above.

Grading Criteria:

Requirements and Points: all points will be weighted equally for a maximum possible 870 points.

Assignment - Points

1. Weekly Quizzes (130)

2. Weekly Discussions-participation (130)

3. Research Paper-elder interview (150)

Projects - Points

4. Labs and Assignments (260)

5. Midterm (100)

6. Final Exam (100)

Total Tentative Points 870

Grade	%	Points
A	100-90	783-870
B	89-80	696-782
C	79-70	609-695
D	69-60	522-608

Instructor Responsibilities - You can expect your instructor to:

• Attend every class period and arrive to class on time. If I am not there, please WAIT. If I cannot make class due to illness or unexpected events, I will contact you through D2L and will try to give you as much notice as possible.
• Come to class with a good attitude
Be respectful of your ideas and value the diversity you bring to the classroom
• Be open to dialogue that challenges me
• Answer any appropriate questions you may have
• Use a variety of teaching techniques and modalities to accommodate different learning styles
• Return written assignments in class and online in a timely fashion and provide helpful feedback
• Be present during my stated office hours, by phone, email or text
• Minimize disruptions and distractions in the classroom so that everyone has the best possible opportunity to learn

Office Hours and contact information:

FDLTCC email to reach me and can do so anytime: sue.tracy@fdltcc.edu; cell phone at 218-591-6859
My office hours will be by Zoom after class on Tuesday and Thursday from 6:00-6:30 pm. I have put the details in the D2L class calendar for you. You are only required to contact me during this time if you have questions or concerns.

FDLTCC Competencies Across the Curriculum (CAC)

Information Literacy – the ability to use print and/or non-print tools effectively for the discovery, acquisition, and evaluation of information.

Ability to Communicate – the ability to listen, read, comprehend, and/or deliver information in a variety of formats.

Problem Solving – The ability to conceptualize, apply, analyze, synthesize, and/or evaluate information to formulate and solve problems.

Culture – knowledge of Anishinaabe traditions and culture, knowledge of one's own traditions and culture, knowledge of others' traditions and cultures, culture of work, culture of academic disciplines and/or respect for global diversity.

Conceptual Framework

Vision

The vision of the FDLTCCC Education Unit is to be transformational leaders in culturally responsive pedagogy and Indigenous knowledge by embracing Niindaa'iwedaa o'o gikendaasowin, which means sending knowledge into the future by embedding Anishinaabe knowledge, culture, and traditions into the curriculum and instilling these teaching practices in our future educators.

Mission

The mission of the FDLTCC Education Unit is to work within our communities to prepare caring, competent educators by promoting equitable, inclusive, and transformative educational practices that are based on Anishinaabe knowledge, traditions, and culture.

Cultural Standards Woven Together with Professional Outcomes

The unit has adopted the cultural standards of the WINHEC accredited American Indian Programs and adapted them to meet the specific needs of the education unit. Professional outcomes were developed from the cultural standards. Both the cultural standards and the professional outcomes flow from the unit's vision and mission to provide a unique perspective on teaching and learning. The cultural standards and professional outcomes direct the unit's thinking, planning, actions, and initiatives (see figure 1).

GIKENDAASOWIN – Knowing Knowledge

To prepare our teacher candidates to be problem solvers who strive for continuous learning and growth.

Disposition: Integrates Content and Pedagogical Knowledge

Teacher candidates demonstrate their ability to integrate content and pedagogical knowledge by weaving the following into their teaching:

- Technology: Use technology effectively to improve student learning.
- Theory to Practice: Applies current theory, research, and best practices to improve one's professional practice as a teacher.
- Critical and Connected Thinking: Engages in critical thinking that reflects analysis, problem solving, and incorporates world views and community knowledge to create culturally relevant instruction.
- Reflective Practice: Demonstrates self-reflection and incorporates professional feedback to adjust for continuous improvement in professional practices and effective instruction.

Professional Outcome: Content and Pedagogical Knowledge

- To develop teachers who value and utilize knowledge, learning, and critical thinking that is central to Indigenous and other ways of knowing.

GWAYAKWAADIZIWIN – Living a Balanced Way

To provide teacher candidates the opportunity to recognize the importance of living in harmony with the community and are prepared to use a collective approach to understanding and deciding on a course of action.

Disposition: Communication and Collaboration

Teacher candidates demonstrate professional interpersonal and communication skills. These skills are used to promote positive collaborative partnerships with students, families, colleagues, other school professionals, and the global community to support achievement of student learning outcomes.

- *Reflective Collaboration*: Uses insights and inspiration of others to improve practice and can occur in:
  - Professional Learning Communities
  - Mentoring Programs
  - Peer Observations
  - Critical Friends Groups
- *Community Involvement*: Demonstrates positive collaborative skills in interactions with instructors, advisors, students, colleagues, parents/guardians/caregivers, school teams, and those in the wider community.
- *Communication*: Effectively and accurately communicates ideas, thoughts or visions (oral and written) and engages in active listening based on audience and community cultural norms.

Professional Outcome: Community and Collaboration

- To develop teachers who are reflective, connected educators who understand the interrelatedness of educating the whole child by including the community.

ZOONGIDE'EWIN – Strong Hearted

To provide a foundation on which we build and strengthen each teacher candidate's resilience, innovation, and passion.

Disposition: Vision and Leadership

Teacher candidates demonstrate the vision and skills necessary to lead and manage classrooms and schools as complex, adaptive systems in a changing world.

- Demonstrates skills and qualities that lead to meaningful change.
- Models and fosters respect for all cultures, identities, and perspectives in words and actions and considers historical pasts to prepare for the future.
- Listens and responds to community needs and understands cultural norms as opportunities for growth and development.

Professional Outcome: Transformational Leadership

- To increase the teachers' leadership capacity to live and walk with a strong heart, respectful and open to new ideas and courageous enough to confront the accepted truths of history and society.

AANGWAAMIZIWIN – Diligence and Caution

To develop teacher candidates' capacity to proceed carefully, after identifying, discussing and reflecting on logical and ethical dimensions of political, cultural, social, and personal life.

Disposition: Ethical Behavior

Teacher candidates demonstrate professional integrity through behaviors and actions that reflect state and FDLTCC ethical and cultural standards.

- Demonstrate professional and ethical conduct with faculty, faculty supervisors, cooperating teachers, students, parents, colleagues, and community.
- Practices, complies, and understands the school site and the college and unit policies (e.g., academic honesty), as well as Minnesota Code of Ethics for Teachers.
- Adheres to all professional standards, including the use of technologies (e.g., accesses authorized websites, social media and other applications, and uses personal electronic devises as appropriate).

Professional Outcome: Ethical Practitioner

- To develop teachers' capacity to be ethically responsive in respecting their role as an educator and understanding community needs.

DEBWEWIN – Honesty and Integrity

Encourage teacher candidates to develop a deeper appreciation of their own worldview and the worldview of others.

Disposition: Data-Informed Practice

Teacher candidates demonstrate ability to make data-driven decisions as they plan, implement, and evaluate instruction.

- Uses student data to plan and implement instructional strategies and activities.
- Uses assessment data to identify student strengths and deficiencies and adjusts practice based on results.
- Uses formal and informal assessment strategies to evaluate and ensure the continuous intellectual and social development of the student.

Professional Outcome: Assessment and Use of Data

- To expand teachers' potential to think and act with honesty and integrity as they use multiple types of assessment strategies to evaluate student progress and guide student learning and development.

ZAAGI' IDIWIN – Loving and Caring

To encourage the teacher candidates' development of healthy, caring relationships built on respect for all.

Disposition: Equity, Social Justice, and Inclusion

Teacher candidates demonstrate fairness, empathy and compassion based on their belief that everyone can learn. Candidates actively seek out multiple perspectives and diverse experiences to address the academic, interpersonal, and emotional needs of all students.

- Demonstrates and appreciation of the languages, communities, and experiences students bring to the classroom.
- Advocates for and supports Indigenous and other diverse communities and individuals.
- Respects the dignity and essential worth of all individuals.
- Interacts with sensitivity to community and cultural norms.
- Values and responds to all aspects of a child's developmental well-being (cognitive, emotional, psychological, social, and physical).
- Promotes the diversity of opinions, ideas, and backgrounds.

Professional Outcome: Diversity

Promote teachers' acceptance and respect of the diversity within their school, community and environment.

ZHAWENINDIWIN – Compassion

To encourage teacher candidates to develop an empathetic appreciation of the arts and humanities as a way to understand the human experience.

Disposition: Life-long Learner

Teacher candidates engage in professional growth and encourage curiosity and inquiry as reflective agents of change by sharing knowledge responsibly and participating as a community resource.

- Demonstrates commitment to professional development and intellectual curiosity.
- Practices current skills while demonstrating ability to adapt and develop new skills.
- Actively participates or fosters the positive professional learning environment within the school community as well as the school- home relationships.
- Analyzes various professional contexts, resulting in more informed decision-making about professional practice.

Professional Outcome: Generation of New Knowledge

To expand teachers' knowledge of the human condition and cultures, and the importance of compassion especially in relation to behavior, ideas, and values.

MN PELSB Standards of Effective Practice (SEP) and/or Content Standards

Or

Content Standards*: 8710.3200 Elementary Education*

Minnesota Board of Teaching Learning Standards: 8710.3200 Subject Matter standards:

• 8710.3200 Subject Matter standards:

J: A teacher of children in kindergarten through grade 6 must demonstrate a fundamental knowledge of scientific perspectives, scientific connections, science in personal and social perspectives, the domains of science, and the methods and materials for teaching science and scientific inquiry. The teacher must: § J2: know and apply the understandings and abilities of scientific inquiry including the ability to:

• J2c: use appropriate scientific instrumentation and equipment and mathematics as tools to improve scientific investigations and communications;

• J2e: evaluate alternative explanations and models based on evidence, current scientific understanding, and logic.

• J2f: communicate and defend a scientific argument.

J5: know and apply the fundamental concepts and principles of physical science concerning properties of and changes in matter; position, motion, and force; light, heat, electricity, and magnetism; and kinds of and ways to transfer energy.

J7: know and apply the fundamental concepts and principles of earth and space science concerning properties of earth materials; objects in the sky; changes in earth and sky; structure of the earth system, including hydrosphere, biosphere, atmosphere, and lithosphere; history of the earth; and earth in the solar system

Resources