

**OAKLAND UNIVERSITY
SCHOOL OF EDUCATION AND HUMAN SERVICES
TEACHER DEVELOPMENT AND EDUCATIONAL STUDIES**

**Fall 2018
COURSE SYLLABUS**

1. COURSE: EED 4260: Teaching Science at the Elementary-Middle Levels; 4 credit hours; Teacher Development and Educational Studies, Tuesdays, 1:00-4:20, Room 110 Macomb University Center

2. CATALOGUE DESCRIPTION:

Develops philosophies, rationale and methods for teaching elementary and middle school science. Explores knowledge and skills for planning instruction, using instructional models, integrating the curriculum, using current instructional materials and evaluating outcomes. Includes a required field experience and additional science teaching experience.

3. DROP DATE INFORMATION:

The last day to drop this class with 100% tuition refund, as well as other important academic dates, can be found on the Office of the Registrar web page that <https://wwwp.oakland.edu/registrar/important-dates/>. For this term, the final drop date is September 18, 2018 (by 4 PM).

4. COURSE EVALUATION:

Course evaluations are available approximately 2 weeks prior to the final day of classes at <http://www.oakland.edu/evals>. The last day of class is the last day to complete the evaluation. Please take the time to complete your course evaluation as this information is important to instructors and to the overall teacher education program.

5. AUTHORIZED INSTRUCTOR:

INSTRUCTOR:	Patti Bills
OFFICE:	470G A Pawley Hall (TDES)
OFFICE HOURS:	By appointment
PHONE:	(269) 569-1522 (cell) (248)370-4614 (office)
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6. PREREQUISITES: Prerequisite(s): admission to major and EED 3000 (354) and SCS 2060 (105).

7. REQUIRED READINGS AND MATERIALS:

All course material posted on <https://moodle.oakland.edu/moodle/login/index.php> for this course. Achieve, Inc. (2013). *Next generation science standards*. Retrieved from www.nextgenscience.org (Copies will be available in class)

The Council of Chief State School Officers (CCSSO). (2013), *Interstate Assessment and Support Consortium (InTASC) model core teaching standards and learning progressions for teachers*. Retrieved from https://www.ccsso.org/sites/default/files/2017-12/2013_INTASC_Learning_Progressions_for_Teachers.pdf

Michigan Department of Education. (2003). *Michigan Professional Educator's Code of Ethics*. Retrieved from http://www.michigan.gov/documents/Code_of_Ethics_Layout_128009_7.pdf December 12, 2016.

Michigan Department of Education. (2008). *Certification standards for elementary teachers*. Retrieved from https://www.michigan.gov/documents/mde/Elementary_Standards_JAN2008_231066_7.pdf April 4, 2016.

Michigan Department of Education. (November, 2015). Michigan K-12 Standards. Retrieved from http://www.michigan.gov/documents/mde/K-12_Science_Performance_Expectations_v5_496901_7.pdf, April 4, 2016.

University of Michigan (2016). TeachingWorks: High-leverage practices. Retrieved from <http://www.teachingworks.org/work-of-teaching/high-leverage-practices> April 4, 2016.

8. LEARNING GOALS FOR CANDIDATE PERFORMANCE:

1. Candidates know, understand, and use fundamental concepts in the subject matter of science – including physical, life, and earth/space sciences – as well as concepts in science and technology, science in personal and social perspectives, the history and nature of science, the unifying concepts of science, and the inquiry processes scientists use in discovery of new knowledge to build a base for scientific and technological literacy. (MI Elementary Science Certification, 1.1)
2. Candidates know and demonstrate an understanding of how to teach so that students use inquiry to learn, conduct investigations, learn from a variety of sources, communicate, and use technology. (MI Elementary Science Certification, 1.2.1)
3. Candidates know and demonstrate an understanding of safe science practices (Council of State Science Supervisors) including the ethical and appropriate use and care for living organisms, scientific equipment, safe storage, use and disposal of chemicals. (MI Elementary Science Certification, 1.2.1.1)
4. Candidates reflect on scientific knowledge, which includes analytical thinking and reflective practices about claims for scientific merit, explanations by scientists as to what constitutes scientific knowledge, how science is related to other ways of knowing, how science and technology affect our society, how people of diverse cultures have contributed to and influenced developments in science and how scientifically literate students can describe the limitations of their own knowledge in general. (MI Elementary Science Certification, 1.2.2)
5. Candidates work with others to create environments that support individual and collaborative learning, and that encourage positive social interaction, active engagement in learning, and self-motivation. (InTASC 3)
6. The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues. (InTASC 5)
7. The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making. (InTASC 6)
8. The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context. (InTASC 7)
9. The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. (InTASC 8)

Note: The remaining Michigan Elementary Science Certification Standards as well as remaining InTASC standards are also integrated into the course. The standards listed above are the focus.

9. FIELD EXPERIENCE:

Students will complete a field assignment as part of the course structure that involves teaching science and STEM to elementary or middle level students. This experience affords students the opportunity to implement science and/or STEM teaching strategies into various classroom settings. Students will have optional assignments that also involve teaching in field settings. Students may also attend professional science teaching conferences or professional development workshops as an integral component of the course.

10. METHODS OF INSTRUCTION:

This course requires the active participation of students. Methods of instruction include: online learning, interactive applications, lecture/demonstration; laboratory/field experiences; media presentations; review and analysis of teaching strategies/materials; library research; collaborative/cooperative learning.

11. PERFORMANCE ASSESSMENT:

This course seeks to provide practical, research-based information and practices to prepare you to be an excellent teacher of science. The topics and assignments are organized around key Next Generation Science Standards (MSS), Michigan Elementary Science Certification and InTASC standards. The course topics are listed on the syllabus as well as Moodle. Students are expected to check Moodle postings at least once prior to each session. Students will also be required to read posted assignments and videos posted on Moodle.

1. All formal assignments should be formatted in MS Word or a program that is readable by most computers. Any required attachments may be scanned/photographed and submitted electronically. However, be aware the photos taken by cell phones are often not readable. Complete web addresses should be included in APA formatted citations and references.
2. All assignments should relate to the teaching of *science/STEM* as opposed to general teaching methods.
3. Students are encouraged to arrange to meet with the instructor for help and feedback on assignments. As future teachers, it is essential that you demonstrate care with respect to the submission of written assignments. For each assignment, spelling, grammar, organization, and clarity of written work are evaluated. Errors such as these often result in lower assignment grades.
4. Assignments are to be uploaded to Moodle by the due date and time. Assignments turned in past the due date will be accepted for reduced credit. (A reduction of 10% of the total points possible will be taken for each week the assignment is late.)
5. All assignments are expected to be the individual student's original work and writing or reference appropriately (e.g., lessons from school or cooperating teacher not presented as your own work). Students are strongly encouraged to complete the online Plagiarism Tutorial found on the Kresge Library website. All allegations of academic misconduct will be reported to the Dean of Students and, thereafter, to the Academic Conduct Committee for adjudication. Anyone found guilty of cheating in this course may receive a course grade of 0.0, in addition to any penalty assigned by the Academic

Conduct Committee. Please refer to the 2018-2019 Oakland University Undergraduate Catalog to read the full *Academic Conduct Policy* listed under *Other Academic Policies* online at <http://catalog.oakland.edu/content.php?catoid=37&navoid=4612>

6. Science teaching requirement: The student must have a primary role in teaching science, rather than as a helper or observer. The intent of this requirement is to help build experience and confidence in the teaching of science. The science teaching experience should involve engaging students in hands-on opportunities rather than reading to students about science. For assignments that may take place in your formal field placement, the cooperating teacher should be advised that the EED 4260 instructor may contact her/him to verify the science teaching hours.

7. A special note is needed about the use of photos, videos or other media that may be collected during this course. You must tread carefully and it is your responsibility to understand the policies related to this area. It is your responsibility to seek permission to take photographs or to video your teaching. The instructor will have asked about this policy for group settings, however it is still best to speak directly with the teacher regarding policies and make sure that you are able to articulate the purpose, the use and limitations of use, and the protections you will enact. In most cases, the teacher will already be aware of the assignment in group settings and will have already sought permission from parents according to school district policy and will be able to indicate who is not allowed to be photographed or video-recorded. Also be sure that you are familiar with, and able to use, technology applications that can be used to blur faces or otherwise de-identify individuals within photographs or video recordings. Professional staff members (e.g., Julie Chapie) in the Educational Resources Laboratory can provide support with this technology. Photographs or video are for your assignments or teaching portfolio and are not allowed to be published in any way (e.g., web, newsletter) for this course. All digital portfolios must be password protected.

8. Use appropriate video applications for sharing videos with the instructor via Moodle, email (Google Drive). For example, (.wmp) files will not open. These are Movie Maker projects and need to be saved as a viewable video file. You may need to compress larger files – if the file is over 200 M, then the instructor is not able to comment within the video and the video file takes an extraordinary time to download. Hand Brake is a campus supported compressing software and will be installed on all ERL computers very soon. It is already installed on all computers at the Student Technology Center (STC). Hand Brake is a multi-platform, free program which can be downloaded at: <https://handbrake.fr/> Professional staff members (e.g., Julie Chapie) in the Educational Resources Laboratory can provide support with this technology.

12. ASSIGNMENTS AND RUBRICS

PLEASE CHECK MOODLE FOR MORE INFORMATION ON EACH ASSIGNMENT

Attendance and Participation (20 points)

Credit is earned for full, positive, participation at each class period. Additionally, each student is responsible for maintaining a clean classroom environment during the semester as part of positive participation. Tardiness and partial attendance is often disruptive to class and full participation points will not be earned when this occurs. Because of the nature of class activities, it will be impossible to make up missed class time. However, check with your classmates and/or instructor to ensure that you did not miss critical information. Points will not be earned for missed sessions, irrespective of the nature of the absence, and students need not provide a reason.

To encourage full participation, students may earn attendance points as follows:

2 points:	Full, positive participation (i.e., not texting, e-mailing, surfing) and arrive/depart as scheduled.
1.5 points:	Positive participation but late arrival or early departure.
0.5 point:	Participation limited and/or significant late arrival early departure.
0 point:	Session not attended

Text Quizzes and Video Responses (40 points)

Homework is due each week before the start of each class session for the first 8 weeks (5 points each week). Each assignment may include readings or viewing science teaching videos on Moodle. After completing the reading or video assignment, you are required to respond via an online quiz, assignment and/or discussion forum posting. NOTE: Discussion forums are in a “Q&A” format. This means that you will only be able to view other responses after you have posted your response. In addition to posting to the forum on the prompt or question(s), you are also expected to provide a thoughtful response to at least one of your classmates for each discussion forum. Grading on the discussion forum postings or video assignments will be based on these criteria:

1. **Quantity and timeliness:** Creating a post early in the week before the class period it is due, as opposed to waiting until the day before class. Response is sufficient length to fully answer the prompt or question(s). Note that this is for the initial response, but responses to others might be delayed so that you can read your classmates’ responses.
2. **Demonstrates knowledge and understanding of content and applicability to professional practice:** The prompts and questions are related to the assigned text readings and/or information presented during course sessions (e.g., power points, activities, lectures). Your response should demonstrate clear evidence of knowledge and understanding of the content.
3. **Generates learning within the community:** Response is applicable, practical and elicits responses and reflection for others.

Note: These criteria were based on http://www.pbs.org/teacherline/courses/common_documents/disc_assess.htm and more detail is provided at this web site.

Inquiry Lesson Identification (5 points)

Once you have been assigned to a team with a specific grade level (and topic) then you will be required to locate three potential inquiry lessons that align with the teaching assignment. **Note that this is not a team assignment – each team member locates 3 inquiry lesson examples.** Provide a brief analysis of the usefulness and appropriateness of each of the three lessons according to the following:

1. Begin this assignment by reading information on your assigned topic and identify the associated NGSS standard(s). Then find or select three lessons from three different sources. **These must all be inquiry lessons.** They must be found in professional resources such as published texts, journals, or other peer-reviewed online sources (e.g., NSTA, NASA, Discovery, National Geographic, PBS) as opposed to sources that are not professionally reviewed such as Pinterest or teacher’s blogs. Provide an electronic copy (e.g., hot linked web address) or hard copy (see Note) of the three lessons and upload them to Moodle. Also, either bring a hard copy or provide access to the digital version in class. **(2 pts)**
2. Provide a brief (2-3 sentences) summary of each lesson. Think about your science teaching context and at least 3 strengths of each lesson and at least one potential concern. For each of the

- 3 lessons you found, list the standard (words and code) and write a thorough paragraph (150-200 words) that provides a summary of these strengths and weaknesses for the lesson. **(2 pts)**
3. Proof-read your work and take care to use correct grammar and spelling. Provide correct APA references for each of the three lessons. Use the APA referencing help (APA Reference Guide, help with APA Citations) or seek help from the professor to provide correct references. **(1 pt.)**

STEM Lesson Identification (5 points)

Once you have been assigned to a team with a specific grade level (and topic) then you will be required to locate three potential STEM lessons that align with the teaching assignment. **Note that this is not a team assignment – each team member locates 3 STEM lesson examples.** Provide a brief analysis of the usefulness and appropriateness of each of the three lessons.

1. Begin this assignment by reading information on your assigned topic and identify the associated NGSS standard(s). Then find or select three STEM lessons – they may be from the same source. The lessons must be found in professional resources such as published texts, journals, or other peer-reviewed online sources (e.g., NSTA, NASA, Discovery, National Geographic, PBS) as opposed to sources that are not professionally reviewed such as Pinterest or teacher's blogs. Provide a hard copy or electronic copy (e.g., hot linked web address) of the three lessons and upload them to Moodle. Also, either bring a hard copy or provide access to the digital version in class. **(2 pts)**
2. Provide a brief (2-3 sentences) summary of each lesson. Think about your science teaching context and at least 3 strengths of each lesson and at least one potential concern. For each of the 3 lessons you found, list the NGSS standard (words and code) and write a thorough paragraph (150-200 words) that provides a summary of these strengths and weaknesses for the lesson. **(2 pts)**
3. Proofread your work and take care to use correct grammar and spelling. Provide correct APA references for each of the three lessons. Use the APA referencing help (APA Reference Guide, help with APA Citations) or seek help from the professor to provide correct references. **(1 pt.)**

Final Lesson Modifications (4 Components: Inquiry Lesson/15 points, STEM Lesson/15 points, 2 Responsive Teaching Modification/5 points each)*

Inquiry Lesson (Team Assignment): This assignment requires you critically examine a science lesson within a research framework and modify it to become a lesson which reflects best practices in science teaching. Specifically, this lesson will assess whether you understand lesson components that engage students in *scientific inquiry*, as defined in the *Science and Engineering Practices*. As future teachers, it will be important to be able to examine prepared lessons (i.e., textbooks, activity book, Internet lesson, etc.) with a critical eye and then make the changes to reflect quality instruction as well as meet the needs of the classroom and students with whom you are working this semester. Lessons that require the students to “do research on” rather than providing for concrete inquiry learning experiences for students are not acceptable for this assignment. The lesson must target a Performance Expectation along with associated *Science Practices, Disciplinary Core Ideas, and Cross Cutting Concepts* related to life, physical, or earth science. Lessons that do not clearly target new science content understandings or simply have students doing research on a topic will be returned to the student without evaluation.

Grading on the inquiry lesson will be based on these criteria:

Students will be required to: (1) write a lesson plan (based on the found lesson) in Google Docs in the format provided in class and on Moodle, and share with the instructor, (2) provide the hyperlink to the

original document (written at the top of the Google Doc) in APA format, (3) a 1-page summary of the modifications you made to the original lesson. The assignment should include:

1. An overview of the changes you made to the published lesson and a rationale for why these were the best changes to make, must be included. As part of your rationale, describe the cultural context of the learners for whom this lesson is designed, which includes both information about the SES, the cultural diversity of the students, and a description of any students with special needs. **(4 pts.)**
2. The modified lesson must follow the “Science Lesson/Activity Format” (and include the 5E’s) found on Moodle. It must be clear how students are engaged in scientific inquiry as opposed to other science methods (e.g., hands-on alone, integrating literature, games). Each component found on the lesson format page will be evaluated for the quality, thoroughness, and clarity. **(5 pts.)**
3. The pre- and post-assessments are complete. The assessments must describe the method for collecting information on individual understanding. It should also include how the assessments will be used to influence future teaching. Answers, criteria for assessment and a rubric for evaluation must be clearly documented and strongly connected to the lesson. **(2 pts.)**
4. Consider the cultural context of the students you wrote about in part 1. Provide evidence that you have made adjustments to the published/modified lesson according to the specific students’ needs. Your lesson procedures must show evidence of your considerations for the needs of all students (e.g., ELL, special needs, cultural diversity, SES, etc.). Such evidence might be in the form of specific accommodations you are making for ELL students, for example. Or, you write specific strategies for special needs students in your class. To earn points for this part of the assignment, your lesson must include at least 3 specific accommodations or considerations. **(2 pts.)**
5. Lesson is well written, all components present with thorough descriptions, scholarly with APA references. APA references and citations for your lesson as well as support materials are required for the lesson. Any spelling or grammatical errors will result in a reduction of points earned. **(2 pts.)**

STEM Lesson: This assignment requires you to write a new lesson that incorporates the Engineering Design Process, using the identified NGSS Performance Expectation, Disciplinary Core Ideas, and Science and Engineering Practices. Students will (1) identify and revise an appropriate lesson that includes the essential lesson components (see “STEM Lesson/Activity Format” on Moodle), (2) include components of science, technology, engineering, and mathematics; (3) research background information, and (4) fully develop pre and post assessments, including answers, criteria for grading (rubric) and (5) develop a literacy component for the lesson. The lesson must target the specific DCIs related to life, physical, and earth science that are appropriate to the lesson. Lessons that simply have the students doing research on a topic will be returned without evaluation. It should be evident that: (a) all essential lesson components are thoroughly described (see “STEM Lesson/Activity Format”) and more detailed descriptions of the assessments involved are typically necessary to earn full credit; (b) the lesson is carefully researched and designed to promote the STEM (Science, Technology, Engineering and Mathematics) and the engineering design process within specific science content understandings related to life, physical or earth sciences; (c) the literacy component is fully integrated and applicable.

Grading on the STEM lesson will be based on these criteria:

1. The lesson follows the “STEM Lesson/Activity Format” found in the syllabus. It must be clear how students are engaged in STEM (science, technology engineering and mathematics) and the engineering design process as opposed to other science methods (e.g., hands-on alone, integrating literature, games). **(5 pts.)**
2. The pre- and post-assessments are complete. The assessments must describe the method for collecting information on individual understanding. It should also include how the assessments

will be used to influence future teaching. Answers, criteria for assessment and a rubric for evaluation must be clearly documented and strongly connected to the lesson. **(3pts.)**

3. A literacy component is integrated into the lesson. The primary focus of the lesson is STEM, yet it is crucial for all students to develop the reading and writing skills that apply to learning the content. This lesson will include the use of a trade book to enhance the science content as well as the students' reading skills. The book will be integrated at its most appropriate point in the 5E learning cycle. **(3 pts.)**
4. Well written, all components present, thorough descriptions, scholarly with APA references. Any spelling or grammatical errors will result in a reduction of points earned. **(4 pts.)**

Responsive Modifications (5 pts. Possible) for Inquiry or STEM Lesson: Your team should conduct the investigation or lesson that you will be doing with students. As you are doing this think about what you are learning, how the investigation will work with your students, and modifications that should be made. After you have completed the investigation/lesson, reflect on the results, any changes that might be helpful, and what you learned as a result of the experience.

This modification assignment requires you to revise your science inquiry lesson **or** STEM in light of the feedback you received. Students will be required to hand in: (1) a copy of the original lesson that was submitted for grading (Inquiry and STEM) (2) the modified lesson with modifications highlighted and bolded for ease in viewing, and (3) a 1-2 page overview of the modifications you are planning in order to effectively teach the lesson.

1. Lesson modifications: original and modified lesson **(2 pts.)**
2. Report on overview of modifications: Describe the results of the investigation/lesson: (1) What happened? What were the results? (2) What didn't go as expected? (3) What did you learn? (4) What changes do you envision for doing this with students? (5) Other reflections? **(2 pts)**
3. Assignment is thorough, well-written, and free of grammatical and spelling errors. APA references as appropriate (e.g., lesson or other information) **(1 pt.)**

***The Inquiry Lesson, STEM Lesson, and Modifications may be completed as a team assignment (with your teaching partner(s)) or individually. If completed collaboratively with your teaching partner, it is expected that you will work together on all components. Therefore, you will bear responsibility for all components of the assignment as well.**

High-Leverage Teaching Practice: Eliciting and Interpreting (5 points for peer feedback, 20 points for audio/video files and all report components)*

Eliciting and Interpreting Assignment General Description (25 pts. total). Read and review the directions on Moodle: "Eliciting and Interpreting Complete Instructions". You are required to audio or video record your interview with the student. The student's work and responses should not be published or shared beyond the scope of this assignment. You may also need to seek assistance in making a recording of your interview. You will need to submit:

1. Eliciting and Interpreting Written Report
2. Good quality (audible or viewable) Audio or Video Electronic file of the Interview
3. Permission verification from the parent or guardian or classroom teacher if the teacher has this authority
4. Self-Assessment Feedback Form

Prepare for the interview as described in the instructions. Be sure that you have the prop(s) prepared ahead of time (e.g., condensed water on clear glass) and that you have drawing materials or other materials available to the student for demonstrating their ideas.

An audio or video recording must accompany your assignment submission or it will not be graded.

Part A. Written Report, 12 pts. possible, evaluated on these components:

1. Preparation questions (4) and post-interview questions (7) are thoroughly and completely answered.
2. Evidence from the interview in the form of time-stamps and verbatim quotes are included in your responses when reasonable to support your answers. Specifically, post-interview questions 1-3 require evidence from the interview.
3. Evidence that you clearly understood the more advanced scientific ideas in questions 5-7 to show how the young student's beliefs support (or do not support) more advanced understandings.
4. Answers to reflection questions demonstrate understanding of key components of elicitation and interpretation.
5. Answers to reflection questions demonstrate insightful reflection on personal areas of strength and development.
6. Report was proof-read and care was taken to use correct grammar and spelling.

Part B. Self-assessment/Peer Feedback, 5 pts. possible:

1. The extent to which each of the categories was documented;
2. Time-stamp evidence that provides specific information to your partner;
3. Specific quotes and other evidence that support your claims;
4. Thoroughness and completeness of the form

Part C. Audio or Video Recording & Permission, 3 pts. possible: Audio or video recording was clearly audible or visible with correct orientation. It was uploaded in a format that is accessible. For example, if the file size is excessive it should be compressed. Permission from the parent, guardian, or teacher was uploaded.

Part D. Eliciting and Interpreting Peer Feedback (5 pts.). In class you will engage in an eliciting and interpreting scenario with your classmates. During this experience, you will act as the interviewer and the student who is interviewed and you will audio-record your work. You and your partner will share your audio-recordings with each other and provide accurate, thorough, and specific feedback to each other using the feedback form found on Moodle and shared in class. You will upload the feedback you provided to your partner to Moodle (Eliciting and Interpreting Peer Feedback) and your feedback will be evaluate based on:

1. The extent to which each of the categories was documented;
2. Time-stamp evidence that provides specific information to your partner;
3. Specific quotes and other evidence that support your claims;
4. Thoroughness and completeness of the form.

Curriculum Resource Review Presentation - In Class Project (10 points) – For this assignment you will simulate being on a curriculum team for a school district, charged with the task of reviewing the new science curriculum resources your district will purchase. You will first meet as a team, carefully review a given resource, and then teach your classmates the important information about the assigned curricular resource. When doing so, you will also plan a hands-on experience from the resource that captures the type of lessons that students generally experience through using that curriculum. Lastly,

you will make a formal recommendation on whether the district should purchase the curriculum resource, and why.

Team Presentation of Curriculum Resource: Your presentation should be planned for 20-30 minutes. It should include a Power Point with: (1) Important information related to your resource (as detailed on the curriculum guide); (2) Simple directions to the science investigation; (3) Your recommendation on whether you would recommend this resource for purchase. Your presentation will generally include a short introduction to the resource and basic information highlighting its strengths and weaknesses. The majority of the time will be spent engaging your classmates in a science investigation that is representative of activities found within the resource.

1. Power Point and Advanced Preparation (4 points possible)

- a. Answers to questions were researched and investigated whenever possible and included in the PowerPoint.
- b. Power Point was proofread for spelling and grammar.
- c. Evidence that after the activity was tried out and practiced ahead of time, changes were made to address any issue.
- d. Materials were acquired well ahead of time.

2. Presentation Content (4 points possible)

- a. Presentation planned to teach important information related to the resource.
- b. Strengths and weaknesses of the curriculum resource were made clear.
- c. Presentation included a recommendation on whether to purchase the resource and why.
- d. Majority of presentation time was devoted to having students engage in a representative hands-on activity associated with the resource.

3. Teaching Features During the Science Investigation (2 points possible)

- a. Each team member had an equal part in the presentation.
- b. Attention to safety was prioritized and included as part of the science experience.
- c. Attention to how materials would be handled and distributed was included as part of the science experience.
- d. A purposeful means of grouping students was used when students were grouped.
- e. A (very) short pre- and post- assessment experience was included in the science presentation.
- f. The teacher(s) asked questions rather than lecture or “tell” during the science experience.
- g. The teacher(s) modeled a positive learning environment (e.g., enthusiasm, clear and professional verbal expression).

Evidence of Effective Science Teaching – Inquiry Lesson and/or STEM (or modification, as necessary) (10 pts. each)

You will teach your chosen lesson(s) (inquiry and/or STEM as above) in a classroom with children. You will video tape your teaching and provide the instructor with a 5-minute video clip of your best example from that teaching (see below). The instructor will evaluate your teaching effectiveness based on the criteria listed below. **This is an individual evaluation.**

- 10 = All criteria excellent and completely addressed all components;
 8 = All criteria addressed very well with no major area of deficiency;
 6 = Most, not all, criteria addressed and with thorough attention to detail;
 5 = Most, not all, criteria addressed however additional practice related to some elements would have strengthened teaching the lesson;

- 4 = Most criteria met, but some significant gaps were present;
 2 = Significant gaps were evident and diminished the teaching and learning experience;
 1 = Teaching took place but criteria not addressed.

1. Advanced Preparation

- Evidence that after the lesson was tried out and practiced ahead of time, changes were made to address any issue.
- Materials were acquired well ahead of time.
- Teaching planned to actively involve students in DOING inquiry science or STEM (hands-on rather than demonstration or making something) that reflects the standard.

2. Teaching Content

- New science or STEM content was introduced and explained during the lesson.
- Important concepts, as identified by the standards, were taught.
- Concepts were introduced or taught at the appropriate level for the students.
- Relevant and real-world examples were used.

3. Teaching Features

- Relevant phenomenon, science and engineering practices (SEPs), and disciplinary core ideas (DCIs) were appropriately presented and children were guided in their sensemaking.
- Students were guided toward explanations of content through specific teacher talk moves and high-leverage practices as studied in the course (e.g., uptake of student misconceptions, eliciting moves, follow up questions).
- Visual tools such as models, posters, demonstration materials, worksheets, were used as appropriate.

4. Learning Environment

- Asked questions of students rather than lecturing or reading to them.
- Modeled positive learning environment (e.g., enthusiasm, clear and professional verbal expression).
- Time for teaching plans were appropriate (e.g., backup plans evident).

IMPORTANT NOTE: For teaching assignments, you are representing yourself as a qualified pre-professional who has worked diligently to prepare herself/himself to effectively teach science to children. You should *be* a professional in actions, dress, behavior, language, and demeanor. You are also representing Oakland University. If there is evidence that you have not adequately prepared for these teaching assignments, or do not appear to be ready to work with children and assume the associated responsibilities, **then you will not be allowed to complete the teaching portion of the assignments.** This decision will be rendered by **Nov. 3, 2018 or up until the teaching assignment is scheduled based on the circumstances. You will not earn credit for the assignment in cases of removal.** Examples of evidence include, but are not limited to, limitations in participation/attendance, late assignment submissions, poorly developed assignments, or inadequate teaching practice and preparation such as not having all required materials on the scheduled practice day. For cases when the instructor indicates you are not prepared for this teaching assignment, attendance at the course sessions is still required.

Reflective Teaching Reports – Inquiry Lesson and STEM (10 pts. each)

You have carefully planned, prepared for, and taught a specific inquiry and/or STEM lesson (approximately 45-60 min lesson). You have video recorded the entire lesson.

This reflective report will provide specific information on what you did, a reflective analysis of the teaching strategies you employed with respect to professional standards and high-leverage practices, as well as an account of your teaching strengths and what you would do differently if you were to teach this lesson again.

Read the performance sub-standards and associated information of InTASC Standard # 8: The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways. You will find this information on pages 38-40 within the InTASC standards: http://www.ccsso.org/Documents/2013/2013_INTASC_Learning_Progressions_for_Teachers.pdf

Write a 2-3-page report (introduction, details, conclusion) that addresses the following:

1. Describe your teaching according to the following (include lesson as attachment or hot link): (1) when and where you conducted the lesson, (2) specific information about the students, (3) how much of the lesson you were able to teach and what adjustments you made and why **(2 pts)**.
2. Review the entire video recording of your teaching and the Standard #8 performance sub-standards. Look carefully at the 5-minute portion you provided your instructor. Provide a reflective account of how 2 performance sub-standards (InTASC#8, Instructional Strategies) were evident in your video submission. (1) Identify (list the specific InTASC substandard) and describe the evidence in your teaching for each sub-standard (identify each with a time stamp), (2) Describe, in your own words, how you were attempting to employ at least one high-leverage teaching practice (e.g., eliciting and interpreting). **(3 pts)**
3. Based on your video analysis of teaching: (1) What were your teaching strengths? (2) What do you want to focus on to improve your teaching? (3) Other reflections? **(3 pts)**
4. Assignment is thorough, well-written, and free of grammatical and spelling errors. APA references as appropriate (e.g., lesson or lesson) **(2 pts)**

Choice Assignment – Choose One (A or B) (20 Points)

A. Present and Attend a Professional Conference (20 Points Possible)

Conduct a Mini-Presentation of a Science or STEM Lesson at a Professional Science Teaching Conference. This semester, OU will host a presentation at the Michigan Science Teachers Association Conference on Saturday, November 3, 2018 at 11:00 AM. **Your lesson must be reviewed and approved by instructor prior to presenting to students in class.** It may be a modified version of the “Finalized Science Lesson” or a STEM lesson. If previously turned in, then the lesson must be updated according to instructor’s comments. If it is a new lesson, then the lesson must be submitted to the instructor for review before the classroom presentation. This assignment may be co-presented with **one other student**; however, co-presenters must share all responsibilities and take turns or “switch off” during the presentation time. Plan on being able to present the lesson in less than 10 minutes and you will repeat your presentation multiple times.

Field Testing:

It is best if this lesson is field-tested with “real students” before presenting it at OU; however, that may not be possible and is not required. If this lesson is field tested, you may include this teaching experience in your Science Teaching Hours.

Professional Presentation Component (12 points possible)

Each student must:

1. not use live animals, dangerous or unknown chemicals, or have participants engage in anything that could potentially cause harm; b) provide your instructor with the presentation title and your name (s) by Session #5; and c) present this lesson to classmates just as you would during the MSTA presentation. Classmates will provide feedback on your presentation. **(2 pts.)**
2. create a one two-sided page summary or tri-fold handout of the lesson for distribution. The handout should include: names and affiliations of presenters, lesson title, purpose statement, materials list, summary of procedures, safety considerations, and lesson reference; b) prepare 50 copies of this handout, and c) keep one copy (in case you run out of handouts) that can be taped to the table. **(2 pts.)**
3. be at the presentation room 30 minutes in advance to set up materials; b) consider traffic, parking, and other potential complications as you plan your travel; c) be prepared with all required materials and handouts; d) present your lesson, and e) clean up your presentation site and help others to also clean up a leave in a timely manner. **(4 pts.)**
4. take a photo while presenting your lesson; b) write a 1-2-page reflection regarding your experience and attach the photo of you presenting at the conference. Describe what went well and what you would change if you were to do this again. **(4 pts.)**

Science Conference Report (8 points possible)

1. A thorough description of the activities at two of the sessions of the conference. (Visiting the exhibit hall in NOT an acceptable session, although it is recommended.) If using the Oakland University Extravaganza as a session, a review of at least one lesson must be included. **(3 pts.)**
2. Evaluations on whether each session was well organized, included hands-on opportunities, was valuable for teachers, presented new information that was new to attendees, and the grade level appropriateness of the information. **(3 pts.)**
3. Overall quality (well written, thorough with appropriate length, in on time, scholarly). Any spelling or grammatical errors will result in a reduction of points earned. **(2 pts.)**

B. Five (5) Additional Teaching Experiences (20 Points Possible)

This 20-point choice assignment provides the opportunity to teach five (5) additional lessons beyond those provided within the context of EED 4260. These teaching experiences may include opportunities provided through the Detroit Zoo (City Critters), STARBASE, your field or other locations arranged by you. The lessons you teach may be provided by the location or they may be developed by you. The pre-service teacher must have primary responsibility for teaching, whether it a small group or a whole class lesson. To document your participation, you will be required to submit a Teaching Log and 5 separate Science Teaching Forum postings (20).

Science Teaching Log: The science teaching experience is an integral component of EED 4260. This additional experience helps pre-service teachers develop understanding, skills, and most importantly, confidence in implementing hands-on, inquiry-based science or STEM experiences with students. The methods student should have a primary role in teaching science and working with students to develop scientific understanding, in order to fulfill this requirement. Simply assisting the classroom teacher or only working with small groups (unless approved by the instructor) rather than being responsible for lesson implementation should not “count” towards this requirement. For this Choice Assignment, students are required to teach five science lessons. As a student completes a teaching episode, the student completes the teaching log (provided on Moodle).

Science Teaching Forum: All students will be expected to post a summary and reflection for each of the five science teaching experiences you taught this semester. Your postings should provide a thoughtful and detailed reflection of your teaching opportunity (what you did, where, with whom) and highlight some of the concepts or teaching strategies we have discussed in class or you have assimilated

through your readings. Reflect on what you did well and what you would do differently if you were to teach the lesson again. Feel free to respond to the prompts that your peers post, as well. You may receive up to 4 points for each (posted separately) of your detailed teaching reflections according to these criteria:

4 points: Timely posting, thoughtful posting thoroughly describes the teaching experience (who, what where) and highlights specific teaching strategies implemented; posting includes a reflection of what went well and what are some areas that may need improvement.

3 points: Posting is thoughtful, but lacks one or more criteria listed above.

1 point: Posting is brief and/or does not advance the online dialogue.

0 points: No posting is evident.

12. COURSE REQUIREMENTS AND GRADING:

Assignment/Requirement	Points Possible	Total
Participation and Attendance	65	
Attendance and Participation	20	
Reading/Video Quizzes and Forum Responses	40	
Lesson Development, Resources	55	
Science Inquiry Lesson Identification	5	
Science Inquiry Lesson	15	
STEM Lesson Identification	5	
STEM Lesson	15	
Responsive Modifications (Inquiry or STEM)	5	
Curriculum Review Presentation (Instructor)	10	
Teaching Practices	25	
Eliciting and Interpreting Audio file and all report components	20	
Eliciting and Interpreting Peer Feedback	5	
Teaching and Reflection	40	
Teaching Inquiry Effectiveness (Video/Instructor)	10	
Reflection on Teaching Inquiry	10	
Teaching STEM Effectiveness (Video/Instructor)	10	
Reflection on Teaching STEM	10	
Choice Assignments: Individual, Choose 1	20	
Choice A: Professional Presentation at MSTA	20	
Choice B: Science Teaching (5 Lessons) at Zoo or STARBASE or Formal Field Placement	20	
	TOTAL:	/200
	GRADE:	

GRADING SCALE

Letter Grade	Percent	4.0 Scale	Course Points
A	93-100	4.0	186 - 200
A-	90-92.99	3.7	180 – 185.98
B+	87-89.99	3.3	174 – 179.98
B	83-86.99	3.0	166 – 173.98
B-	80-82.99	2.7	160 – 165.98
C+	77-79.99	2.3	154 – 159.98
C	73-76.99	2.0	146 – 153.98
C-	70-72.99	1.7	140 – 145.98
D+	67-69.99	1.3	134 – 139.98
D	65-66.99	1.0	130 – 133.98
E/F	Below 65	0.0	129 and lower

13. BIBLIOGRAPHY:

See complete list on Moodle.

14. Course Timeline

See Moodle.