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

Summer 2018
COURSE SYLLABUS

1. **COURSE:** EED 4260: Teaching Science at the Elementary-Middle Levels; 4 credit hours; Teacher Development and Educational Studies, Mondays and Wednesdays, 1:00 - 4:20 PM (32255), Room 150 PH

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 May 14, 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:	**Mary Stein**
OFFICE:	485 E Pawley Hall
OFFICE HOURS:	Monday 11 am – 12 pm, Wednesday 4:30 pm – 5:30 pm; **By appointment**
PHONE:	(248) 370-3086
FAX:	(248) 370-2639
e-mail:	stein@oakland.edu

6. **PREREQUISITES:** Prerequisite(s): admission to major and EED 354 and SCS 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 April 30, 2018.

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_Program_Standards_557145_7.pdf April 30, 2018.

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 30, 2018.

University of Michigan (2016). TeachingWorks: High-leverage practices. Retrieved from http://www.teachingworks.org/work-of-teaching/high-leverage-practices April 30, 2018.

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 to elementary or middle level students. This experience affords students the opportunity to implement science teaching strategies into various classroom settings. [Not available during summer semester: 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 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 with a program that is readable by most computers (".doc" or ".pdf"). Any required attachments may be scanned/photographed and submitted electronically. However, be aware the photos taken by cell phones are often not readable. Zip files also are unlikely to be accessible to the instructor. Complete web addresses should be included in APA formatted citations and references.

2. All assignments should relate to the teaching of *practice-based science* 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 late will be accepted for reduced credit (a reduction of 10% for each session 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 KresgeLibrary 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 2017-2018 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=29&navoid=2996#Other_Academic_Policies

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 practice-based science learning 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 will 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. Videos with K-12 students should NOT be uploaded to YouTube even if the video is private. 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. 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 or email (Google Drive). For example, (.wlmp) files will not open. These are Movie Maker projects and need to be saved as a viewable video file. For many video submissions, you may need to compress larger files. 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 session. Participation is often diminished when there is attention to cell phones or computers rather than to the people in the class. 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/participation points generally 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

Assignments, Quizzes, or Forum Responses on Assigned Readings and Videos (30 points)

Homework prior to each session includes readings (on Moodle) or viewing science teaching videos. After completing the reading or video assignment, respond via the online quiz, assignment or discussion forum postings. For Reading and Video Assignments, late submissions are NOT permitted. 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.** 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 session, as opposed to waiting until the day before it is due. Response is sufficient length to fully answer the prompt or question(s).

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.

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.

Practice-Based Science Lesson Identification (5 points)

Once you have been assigned to a team/partner with a specific grade level (and topic) then you will each be required to locate three potential practice-based science lessons that align with the teaching assignment. Note that this is not a team assignment – each team member locates 3 practice-based lesson examples. Review "Guiding Questions to Consider When Reviewing Science and STEM Lessons" and use these questions to 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 lessons from three different sources. **These must all be practice-based science lessons (i.e., investigations of a clear question).** 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, Teachers Pay Teachers, or teacher's blogs. Provide a hard copy or electronic copy (e.g., hyperlinked web address) of the three lessons and upload them to Moodle. **Note that you will also need to bring a copy of each of these lessons to class to share with your teaching partner(s) (which will then be turned in to the instructor). (1 pt.)**
2. Think about your science teaching context and discuss at least 3 strengths of each lesson and at least one potential concern. The 3 strengths and 1 concern should be supported by evidence in the 4 categories of the "Guiding Questions to Consider When Reviewing Science and STEM Lessons" document: Inclusion of Essential Elements; Engagement in NOS and Practices; Appropriateness; Teacher Support. This does not mean that you need to answer every question in each section. It means that you need to review each section and consider either strengths or weaknesses when reading it. For each of the 3 lessons you found, list the standard (words and code) and write a thorough paragraph or two (150-200 words) that provides a summary of these strengths and weaknesses for the lesson. **(3 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 *each* be required to locate three potential STEM lessons that align with the teaching assignment. Begin by reviewing the Engineering Standards for grades K-2 or Grades 3-5. Note that this is not a team assignment – each team member locates 3 STEM lesson examples. Review "Guiding Questions to Consider When Reviewing Science and STEM Lessons" and use these questions to 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, however it is recommended that different sources are used. 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, Teachers Pay Teachers, or teacher's blogs. Provide a hard copy or electronic copy (e.g., hyperlinked web address) of the three lessons and upload them to Moodle. **Note that you will also need to bring a copy of each of these lessons to class to share with your teaching partner(s) (which will then be turned in to the instructor). (1 pt.)**
2. Think about your science teaching context and discuss at least 3 strengths of each lesson and at least one potential concern. The 3 strengths and 1 concern should be supported by evidence in the 4 categories of the "Guiding Questions to Consider When Reviewing Science and STEM Lessons" document: Inclusion of Essential Elements; Engagement in NOS and Practices; Appropriateness; Teacher Support. This does not mean that you need to answer every question in each section. It means that you need to review each section and consider either strengths or weaknesses when reading it. For each of the 3 lessons you found, list the NGSS standard (words and code) and write a thorough paragraph or two (150-200 words) that provides a summary of these strengths and weaknesses for the lesson. **(3 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.)**

Practice-Based Science Lesson, STEM Lesson and Modifications (3 Components: Practice-Based Science Lesson/20 points, STEM Lesson/15 points, Responsive Modification/10 points)*

Practice-Based Science Lesson: 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 *an investigation and practice-based science*, 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. Lessons that require the students to "do research on" rather than providing for concrete investigation 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 Practice-based science lesson will be based on these criteria:

Students will be required to hand in: (1) a copy of the existing published lesson with the reference for its source (a hyperlink to an online source within an APA citation is an acceptable "copy"), (2) the modified lesson which adheres to the guidelines for the *Practice-Based Science Lesson Format* (on Moodle). The assignment should include:

1. The modified lesson must follow the "Science Lesson Format" found on Moodle. It must be clear how students are engaged in a scientific investigation 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. **(10 pts.)**
2. Thoughtful and comprehensive completion of the procedures/ lesson flow elements: Phenomenon, Real-world Connections, and Leading a Group Discussion. **(6 pts.)**
3. 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. **(4 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) develop a literacy component for the lesson. The lesson must target the specific DCIs related to life, physical, or 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"); (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 (i.e., science is the focus within **S**TEM); (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). **(9 pts.)**

2. 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. **(2 pts.)**

3. 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.)**

Modified Practiced-Based Science Lesson (15 pts. Possible): Working with the practice-based science lesson you submitted, you will modify and improve the lesson as noted below. Show any changes or modifications in green font on your original lesson.
1. You will rehearse the lesson with your peers. After you do the rehearsal, think about what you learned, how the investigation will work with your students, and modifications that should be made. Similarly, after

teaching elementary students, you will likely notice some lesson components that should be changed because they did not work as expected. Make the changes to the lesson.
2. Complete the lesson elements that are listed in blue font on the lesson plan format (e.g., 5-E Model, pre- and post- assessments).

For this assignment you need to submit: (1) a copy of the original lesson that was submitted for grading (practice-based science lesson); (2) the modified lesson with modifications in green font for ease in viewing; (3) a paragraph describing the changes you made as a result of your teaching experiences (rehearsal and teaching elementary students).

1. Preparation to practice the science investigation and STEM lesson. All materials were brought to class or secured ahead of time from the instructor. Lesson components were discussed you're your partner and assigned ahead of time. **(3 pts.)**
2. Lesson modifications based on your rehearsal and elementary teaching. A paragraph describing the modifications found in the lesson, why they were needed (e.g., what didn't go as expected). **(4 pts.)**
3. 5-E Model is integrated appropriately into the lesson with each element accurately, clearly and thoroughly described. All elements of the pre- and post- assessments are aligned with the lesson and thoroughly described. **(6 pts.)**
4. Assignment is thorough, well-written, and free of grammatical and spelling errors. APA references as appropriate (e.g., lesson or other information) **(2 pts.)**

***The Practice-based Science Lesson, STEM Lesson, and Modifications may be completed as a team assignment (with your teaching partner) <u>or individually</u>. 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 whether or not your team member's work was up to your standards.**

<u>Curriculum Resource Review Presentation (10 points)</u> – *The majority of this assignment is completed during class time.* Working with at least one other classmate, you will investigate the strengths and weaknesses of a specific science curriculum. You will 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.

Team Presentation of Curriculum Resource (10 pts.): 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 Power Point.
    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. 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).

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

Eliciting and Interpreting Assignment (20 pts.). Read and review the directions: "Eliciting and Interpreting Complete Instructions". You are required to audio or video record your interview with the student (**video recording preferred** unless permission from student/parent guardian is not possible). The student's work and responses should not be published or shared beyond the scope of this assignment. You will 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 (condensed water on clear glass) and that you have drawing materials or other materials available to the student for demonstrating her/his ideas.

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

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.

Self-assessment, 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

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.

IMPORTANT NOTE: For teaching assignments listed below, 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 **May 23, 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.

High-Leverage Teaching Practice: Leading a Group Discussion (10 points)

The directions and rubric for this assignment is on Moodle. From the video recordings of your lessons (practice-based science and STEM), you will select 5 minutes that showcase your ability to lead a group discussion. Your video will be accompanied by a brief report on this high-leverage teaching practice.

High-Leverage Teaching Practice: Implementing Disciplinary Norms and Routines (10 points)

The directions and rubric for this assignment is on Moodle. From the video recordings of your lessons (practice-based science and STEM), you will select 5 minutes that showcase your ability to help students understand the norms of science (e.g., nature of science) and the routines (e.g., practices) in which scientists engage. Your video will be accompanied by a brief report on this high-leverage teaching practice.

2 Evidence of Effective Science Teaching – Practice-based Science Lesson and STEM (10 pts. each)

After observing your preparation for teaching, reading the peer feedback you offered on your team members and what others provided, your teaching in action through a 5 minute video submission (and/or on-site if possible), 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**
    a. Evidence that after the lesson was tried out and practiced ahead of time, changes were made to address any issue.
    b. Materials were acquired well ahead of time.
    c. Teaching planned to actively involve students in DOING practice-based science or STEM (hands-on rather than demonstration or making something) that reflects the standard.

2. **Teaching Content**

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

3. **Teaching Features**
    a. Relevant standard and disciplinary core ideas were identified and/or explained.
    b. Key concepts adequately explained.
    c. Visual tools such as models, posters, demonstration materials, worksheets, were used as appropriate.

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

2 Reflective Teaching Reports – Practice-based Science Lesson and STEM (10 pts. each)

You have carefully planned, prepared for, and taught a specific practice-based science lesson and STEM lesson (approximately 45 minute lesson). If at all possible, ask the cooperating teacher or a course peer to observe the lesson and complete the feedback form for you. Attach the feedback to this report. If that is not possible, then contact the instructor for alternative arrangements. Please note that when this form shows areas to work on, this is good news as it provides you with information to improve teaching.

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, 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

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

1. A description of what you did (include lesson as attachment or hyperlink), when and where you conducted the lesson, and specific information about the students taught to provide context. **(2 pts).**
2. Review the video recording and the Standard #8 performance sub-standards. Provide a reflective account of how 3 performance sub-standards (InTASC#8, Instructional Strategies) were evident in your video submission. (1) Write each sub-standard and provide evidence of where one would view this within the video (time stamp) (2) Describe, in your own words, how you were attempting to employ various sub-standards related to instructional strategies (#8) while teaching the practice-based science lesson. **(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? (6) 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)**

12. COURSE REQUIREMENTS AND GRADING:

Assignment/Requirement	Points Possible	Total
Participation and Attendance	**50**	
Attendance and Participation	20	
Reading/Video Assignments, Quizzes or Forum Responses	30	
Lesson Development, Resources	**70**	
Practice-based Science Lesson Identification	5	
Science Practice-Based Lesson (initial)	20	
STEM Lesson Identification	5	
STEM Lesson	15	
Modified Practice-Based Science Lesson	15	
Curriculum Review Presentation (Instructor – In class)	10	
Teaching Practices	**40**	
Eliciting and Interpreting Recording and all report components	20	
Leading a Group Discussion: Video and Analysis	10	
Implementing Disciplinary Norms and Routines: Video and Analysis	10	
Teaching and Reflection	**40**	
Teaching Practice-Based Science Effectiveness (Video/Instructor)	10	
Reflection on Teaching Practice-Based Science	10	
Teaching STEM Effectiveness (Video/Instructor)	10	
Reflection on Teaching STEM	10	
	TOTAL:	**/200**
	GRADE:	

GRADING SCALE

Considered "A's"				Considered "B's"		
Grade	**Percent**	**Points**		**Grade**	**Percent**	**Points**
4.0	100 – 98.6	197-200		3.5	90.59-88.6	177-180
3.9	98.59-96.6	193-196		3.4	88.59-86.6	173-176
3.8	96.59-94.6	189-192		3.3	86.59-84.6	169-172
3.7	94.59-92.6	185-188		3.2	84.59-82.6	165-168
3.6	92.59-90.6	181-184		3.1	82.59-80.6	161-164
				3.0	80.59-79.6	159-160

Considered "C's"				Considered "D's"		
Grade	**Percent**	**Points**		**Grade**	**Percent**	**Points**
2.9	79.59-78.6	157-158		1.9	69.59-68.6	137-138
2.8	78.59-77.6	155-156		1.8	68.59-67.6	135-136
2.7	77.59-76.6	153-154		1.7	67.59-66.6	133-134
2.6	76.59-75.6	151-152		1.6	66.59-65.6	131-132
2.5	75.59-74.6	149-150		1.5	65.59-64.6	129-130
2.4	74.59-73.6	147-148		1.4	64.59-63.6	127-128
2.3	73.59-72.6	145-146		1.3	63.59-62.6	125-126
2.2	72.59-71.6	143-144		1.2	62.59-61.6	123-124
2.1	71.59-70.60	141-142		1.1	61.59-60.6	121-122
2.0	70.59-69.6	139-140		1.0	60.59-59.6	119-120
				.05	30.00-54.6	60-118
				0.0	< 30	< 60

13. BIBLIOGRAPHY:

See complete list on Moodle.

EED 4260 TENTATIVE COURSE TIMELINE
Summer 2018

Session	Date	Topic	Notes
1	May 7	Course Overview - Immersed Engagement	Science Experiences: Nature of Science, Phenomenon, Modeling Teaching Practices: Introduction to HLPs, NGSS Standards, Leading a Group Discussion, Eliciting and Interpreting Student Thinking
2	May 9	The Nature of Science What do I teach and how? Ambitious Science Teaching HLP: Eliciting and Interpreting	Nature of Science Quiz Guiding student investigations (Questions, variables, methods) Reviewing and Appraising Practice-based Science Lessons Grade Level Assignments
3	May 14	Sharing Hard Copies of 3 P-B Lessons Phenomenon and Modeling Safe Science! HLP: Leading a Group Discussion	Confirming the lesson you will teach.
4	May 16	STEM	Short session, time provided for (1) technology support; (2) work on lesson preparation; (2) find 3 appropriate STEM lessons
5	May 21	Sharing Hard Copies of 3 STEM Lessons Practicing science investigation of P-B lesson	Be prepared to do the science investigation **ALL MATERIALS FOR TEACHING REQUIRED**
6	May 23 Off-campus ITA	P-B Lesson Rehearsal Practice Discourse Visit Classroom	Meet at the ITA Formal P-B science lesson rehearsal
7	May 30 Off-campus ITA	1 PM – 3 PM Teach P-B Lesson 3 PM – Reflections and Prep for STEM	**Teaching Practice-based Science at ITA**
8	June 4 Off-campus ITA	STEM Lesson Rehearsal	Meet at the ITA Formal STEM lesson rehearsal **ALL MATERIALS FOR TEACHING REQUIRED**
9	June 6 Off-campus ITA	1 PM – 3 PM Teach STEM Lesson 3 PM – Reflections on Results THANK YOU to ITA	**Teaching STEM at ITA**
10	June 11	Formalizing Science Assessment Implementing Norms and Routines Group Video Analysis	Share 5 minute videos of implementation of norms and routines

11	June 13	Using the 5-E Model Science Curriculum I Leading a Group Discussion Video Analysis	Share 5 minute videos of implementation of leading a group discussion
12	June 18 Off-campus	Science Curriculum II Storylines in Science	
13	June 20	**Course Wrap-up**	

EED 4260 ASSIGNMENT DUE DATES			
Session	**Date**	**DUE**	**Notes**
1	May 7		
2	May 9	Video and Reading Assignment #1 (extension until May 14)	
3	May 14	Practice-Based Lesson Identification (3 Practice-based Science Lessons with summaries)	Hard copies of lessons required in class. Electronic copies and summaries of each submitted via Moodle
4	May 16	Video and Reading Assignment #2	Work on P-B Lesson
5	May 21	(1) Practice-Based Lesson (initial) (2) STEM Lesson Identification (3 Lessons with summaries) (3) Bring science materials to "do" the science investigation	(1) The lesson components that are written in blue font are not required with this submission (they will be required later for the modified lesson). This lesson is developed with your partner. If the lesson is exactly the same as your partner's lesson, then submit one lesson with both names. If it is different, then submit individual lessons. (2) Hard copies of STEM lessons required in class. (3) Bring your science materials.
6	May 23 Off-campus	Video and Reading Assignment #3	Meet at the ITA. Bring P-B Science lesson materials.
7	May 30 Off-campus		Teaching P-B Science at the ITA.
8	June 4 Off-campus	STEM Lesson	Meet at the ITA. Bring STEM lesson materials.
9	June 6 Off-campus	Video and Reading Assignment #4	Teaching STEM at the ITA.
10	June 11	Implementing Norms and Routines: Video and Analysis	

11	June 13	(1) Leading a Group Discussion: Video and Analysis (2) Eliciting and Interpreting Recording and all assignment components	
12	June 18	Curriculum Presentation (in-class) Modified Practice-Based Science Lesson	Original with additional elements as noted in syllabus, class, and lesson format
13	June 20	Practice-based Science Lesson Reflection & Video	
14	June 24	STEM Lesson Reflection & Video Due by 5 PM June 24	