Teaching Science in Intermediate and Middle Grades
(MSED 4311, 21778, Spring 2014)

Department of Teacher Education
College of Education, University of Texas at El Paso

Class meeting time: Wednesdays, 12:00 pm – 2:50 pm
Class meeting place: Room 405, UTEP Education Building
Instructor: Dr. Pei-Ling Hsu
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Office Hours: 9am-12pm, on Wednesdays; by appointments

“The object of education is to prepare the young to educate themselves throughout their lives.”
~Robert Maynard Hutchins~

Course Description
This course discusses various methods and strategies for teaching intermediate and middle grades students. Designing and implementing inquiry-based curriculum and activities in real contexts (i.e., local museums, schools) are at the core of this course. Students are provided with opportunities to learn, evaluate, design, and implement inquiry-based lessons through integrating theoretical and practical perspectives. During the course, students are offered opportunities to practice what they learned in informal science education settings.

Course Introduction
This course draws on theoretical and practical perspectives to examine various instructional methods and resources to teach inquiry-based science in intermediate and middle grades. In the theoretical part, learning theories and research-based practice are presented and discussed. To apply the theoretical knowledge, students are provided with opportunities to examine, design and implement lesson plans that correspond to Texas Essential Knowledge and Skills (TEKS) in a collaborative and supportive environment. In the practical part, students have opportunities to interact with middle school students to gain situated experiences in teaching science. The mechanism and integration of theoretical and practical perspectives in this course allow students to experience a process that can serve as a lifelong learning model to help their professional development in their science teaching careers. This course is designed to help pre-service teachers to achieve the Texas Examinations of Educator Standards (TExES) as indicated in the followings:

- Science Standard I: The science teacher manages classroom, field and laboratory activities to ensure the safety of all students and the ethical care and treatment of organisms and specimens.
- Science standard II: The science teacher understands the correct use of tools, materials, equipment and technologies.
- Science standard III: The science teacher understands the process of scientific inquiry and its role in science instruction.
- Science standard IV: The science teacher has theoretical and practical knowledge about teaching science and about how students learn science.
- Science standard V: The science teacher knows the varied and appropriate assessments and assessment practices to monitor science learning
- Science standard XI: The science teacher knows unifying concepts and processes that are common to all sciences.
Test Framework (Generalist 4-8) – Domain IV (See details for each competency in Appendix)

The course is designed to help students to become competent science teachers who can provide the best learning opportunities for their students. At the end of the course, successful students will develop the following competences:

1) Competency 036: The teacher understands how to manage learning activities to ensure the safety of all students
2) Competency 037: The teacher understands the correct use of tools, materials, equipment, and technologies
3) Competency 038: The teacher understands the process of scientific inquiry and the history and nature of science
4) Competency 056: The teacher has theoretical and practical knowledge about teaching science and about how students learn science
5) Competency 057: The teacher understands the process of scientific inquiry and its role in science instruction
6) Competency 058: The teacher knows the varied and appropriate assessments and assessment practices to monitor science learning in laboratory, field, and classroom settings

Student Learning Outcomes:
The course is designed to help students to become competent science teachers who can provide the best learning opportunities for their students. At the end of the course, successful students will be able to:

1) Identify and evaluate various resources to support teaching
2) Understand science content concepts associated with the applicable TEKS
3) Understand and implement standards for science excellence (TExES, National Science Education Standards)
4) Design and implement a quality scientific inquiry curriculum
5) Develop the ability to assist students in designing investigations using scientific inquiry
6) Appreciate and learn from theoretical and practical perspectives
7) Collaborate with other teachers to create the best learning opportunities for their students
8) Monitor one’s learning and identify ways for improvements

* Assessment of course objectives will be accomplished by assessing the student’s course assignments and participation.

Readings and Handouts


* Additional handouts will be made available in classes. These documents play key roles in guiding your assignments and projects. Changes may be made in classes. Please make sure you read these documents in time.
Resources

- Concept map tool: https://bubbl.us/
- Texas Education Agency (TEA): http://www.tea.state.tx.us/index.aspx
- Texas Essential Knowledge and Skills (TEKS): http://www.tea.state.tx.us/index2.aspx?id=6148
- Texas Assessment of Knowledge and Skills (TAKS): http://www.tea.state.tx.us/index3.aspx?id=3839&menu_id=793
- State Board for Educator Certification (SBEC): http://www.tea.state.tx.us/index2.aspx?id=2147489433
- Texas Examinations of Educator Standards (TExES): http://www.texas.ets.org/texes/
- TExES Preparation Manuals: http://www.texas.ets.org/texes/prepMaterials/
- English Language Proficiency (ELP) Standards: http://www.tea.state.tx.us/index2.aspx?id=5938&menu_id=2147483671&menu_id2=794

Principles for this Course

- **Theory and Practice Integration**
  In the course, theoretical and practical perspectives on inquiry-based curriculum are pursued and discussed. Students are informed by both perspectives to learn instructional strategies and design their lesson plans in ways that work best for their students. The experience of theory and practice integration can help students to experience a lifelong learning model that can benefit their teaching careers for a long run.

- **Community of Practice**
  Community of practice is a concept that depicts how people work together for their common interests and learn from each other’s expertise to develop themselves personally and professionally. To form a community of practice in this course, students are provided with various opportunities to communicate their opinions, share their learning, and help each other improve. In particular, the Science Circus Day is served as a common goal that strives students to prepare themselves, help each other, and collaborate to achieve the goal collectively.

- **Service Learning**
  Service learning is a teaching method that aims to enrich learning experience and strengthen communities through services. This course designs two main activities for students to contribute what they learn in UTEP back to El Paso communities, including middle school teachers, students, families, schools, etc. Students in this course will hold two events of Science Circus Day in Centennial museum for teachers, students, and families to learn and experience science inquiry publicly. These two activities in the course not only can help students learn but also serve the El Paso community in a meaningful way.

Assignments

The following assignments are designed to help students become competent teachers and achieve different objectives below.

1. **Evaluation for Lesson Plan 1 (25%)**
   Objectives:
   - Students will be able to identify and evaluate various sources to support teaching
• Students will be able to understand science content concepts associated with the applicable TEKS
• Students will be able to understand and implement standards for science excellence (TExES, National Science Education Standards)
• Students will be able to develop the ability to assist students in designing investigations using scientific inquiry
• Students will be able to design and implement a quality scientific inquiry curriculum
• Students will be able to appreciate and learn from theoretical and practical perspectives
• Monitor one’s learning and identify ways for improvements

(1) Science circus lesson plan (10%): Two or three students work as a group to design a science circus station that corresponds to TEKS and can facilitate students’ science inquiry abilities. Students are encouraged to use various tools and artifacts in these inquiry activities. A lesson plan is written to show the rationale and justification for their science circus stations. Students are provided with “Template 05- Lesson Plan 2” to fill out. The following components should be written clearly in the lesson plan: (1) lesson title, (2) grade, (3) time, (4) learning objectives, (5) TEKS alignment, (6) concept map, (7) materials, (8) safety consideration, (9) scientific topics, (10) opening activity (hook), (11) practice for the targeted audience, (12) practice for younger audience, (13) practice for the older audience, (14) assessment for the targeted audience, (15) assessment for younger audience, (16) assessment for older audience ways, and (17) reference. The lesson plan (1000-1500 words) is submitted to everyone in the class through the BLACKBOARD system at least one week before their presentations.

(2) Science circus merit presentation (5%): Two or three students work as a group to present their science circle lesson plan and its merits in classes (20 minutes). A powerpoint file should be submitted to the corresponding assignment section through the BLACKBOARD system and a paper-copy of this powerpoint file should be handed in to the instructor before the class on their presentation day.

(3) Science circus critic presentation (5%): Two or three students work as a group to evaluate a science circus lesson plan designed by other groups and present its demerits or suggestions for improvements (10 minutes). A powerpoint file should be submitted to the corresponding assignment section through the BLACKBOARD system and a paper-copy of this powerpoint file should be handed in to the instructor before the class on their presentation day.

(4) Improved lesson plan (5%): Two or three students work as a group to revise their lesson plans according to the feedback they received from the class and from the Science Circus Day event Western Hills Elementary School. The improved lesson plan should be submitted to the corresponding assignment section through the BLACKBOARD system in time.

2. Evaluation for Lesson Plan 2 (25%)
Objectives:
• Students will be able to identify and evaluate various sources to support teaching
• Students will be able to understand science content concepts associated with the applicable TEKS
• Students will be able to understand and implement standards for science excellence (TExES)
• Students will be able to develop the ability to assist students in designing investigations using scientific inquiry
• Students will be able to design and implement a quality scientific inquiry curriculum
• Students will be able to appreciate and learn from theoretical and practical perspectives
• Monitor one’s learning and identify ways for improvements
(5) **Science circus lesson plan (10%)**: Two or three students work as a group to design a science circus station that corresponds to TEKS and can facilitate students’ science inquiry abilities. Students are encouraged to use various tools and artifacts in these inquiry activities. A lesson plan is written to show the rationale and justification for their science circus stations. Students are provided with “Template 03- Lesson Plan 1” to fill out. The following components should be written clearly in the lesson plan: (1) lesson title, (2) grade, (3) time, (4) learning objectives, (5) TEKS alignment, (6) concept map, (7) materials in the Centennial museum, (8) self-created materials, (9) safety consideration, (10) scientific topics, (11) opening activity (hook), (12) practice for the targeted audience, (13) practice for younger audience, (14) practice for the older audience, (15) assessment for the targeted audience, (16) assessment for younger audience, (17) assessment for older audience ways, and (18) reference. The lesson plan (1000-1500 words) is submitted to everyone in the class through the BLACKBOARD system at least one week before their presentations.

(6) **Science circus merit presentation (5%)**: Two or three students work as a group to present their science circle lesson plan and its merits in classes (20 minutes). A powerpoint file should be submitted to the corresponding assignment section through the BLACKBOARD system and a paper-copy of this powerpoint file should be handed in to the instructor before the class on their presentation day.

(7) **Science circus critic presentation (5%)**: Two or three students work as a group to evaluate a science circus lesson plan designed by other groups and present its demerits or suggestions for improvements (10 minutes). A powerpoint file should be submitted to the corresponding assignment section through the BLACKBOARD system and a paper-copy of this powerpoint file should be handed in to the instructor before the class on their presentation day.

(8) **Improved lesson plan (5%)**: Two or three students work as a group to revise their lesson plans according to the feedback they received from the class and from the Science Circus Day event in Centennial Museum. The improved lesson plan should be submitted to the corresponding assignment section through the BLACKBOARD system in time.

3. **Individual Reflection (35%)**

   Objective:
   - Students will be able to appreciate and learn from theoretical and practical perspectives
   - Monitor one’s learning and identify ways for improvements

   (1) **Science Teaching Philosophy (5%)**
   Students are provided with “Template01-Science Teaching Philosophy” to fill out. The completed form should be submitted to the corresponding assignment section through the BLACKBOARD system in time.

   (2) **Reflection on Centennial Museum Visit (5%)**
   Students are provided with “Template02-Reflection on Centennial Museum Visit” to fill out. The completed form should be submitted to the corresponding assignment section through the BLACKBOARD system in time.

   (3) **Reflection on Science Circus Day 1 (10%)**
   Students are provided with “Template04-Reflection on the Science Circus Day 1” to fill out. The completed form should be submitted to the corresponding assignment section through the BLACKBOARD system in time.

   (4) **Reflection on Science Circus Day 2 (10%)**
   Students are provided with “Template06-Reflection on the Science Circus Day 2” to fill out. The completed form should be submitted to the corresponding assignment section through the BLACKBOARD system in time.

   (5) **Improved Science Teaching Philosophy (5%)**
Students revise and improve their first draft of science teaching philosophy lesson plans according to the feedback they receive from the instructor. The final draft should be submitted to the corresponding assignment section through the BLACKBOARD system in time.

4. **Self- and Peer- Assessments on Group Work (5%)**

Students will have opportunities to evaluate self and peer about their collaboration work. Students are invited to create their own criteria to evaluate themselves. Students are provided with “Template07-Self and peer assessments” to fill out.

5. **Class attendance and participation (10%)**

Objective:
- Students will be able to appreciate and learn from theoretical and practical perspectives
- Students will be able to monitor one’s learning and identify ways for improvements

Each week, we have different readings and topics for discussions. Students should be prepared and are expected to participate in the classes actively. Students are expected to attend classes on time and participate in the course professionally. One attendance form will be available to be signed by individual students during the course. Students who have more than two absences may be dropped with an “F” (Fail). In particular, the Science Circus Days are essential in the course. No absences are allowed for these two days. Students missing a class are responsible for completing any exercises, readings, etc.

**Course Requirements:**

1. All electronic reports should be submitted through the BLACKBOARD system and use WORD files. File names should start with “your name” or “group name” and end with “the assignment name.” Taking the name of “Group1” and “Isaac Newton” for example.
   1. Group1-ScienceCircusLessonPlan1.doc
   2. Group2-ScienceCircusLessonPlan1.doc
   3. IsaacNewton-TeachingPhilosophy1.doc
   4. IsaacNewton-ReflectionOnScienceCircusDay1.doc

2. Due time is **8:00AM** for all electronic submissions. Delayed submissions of any assignments will cause grade reductions. One delay day causes 10% reduction of a deserved grade, two delay days causes 20% of a deserved grade, and so on. **All (delayed) assignments have to be submitted before May 14.** Grading Evaluations: A (90% - 100%), B (80% - 89%), C (70%-79%), D (60%-69%) F (<60%)

3. Students are encouraged to take notes during the course for creating your own learning resources.
The Visual Representation of the Course Design

- University Course
  - Lectures and Discussions
  - Lesson Plan Merit and Critic Presentations
  - Virtual Science Circus
- Science Resources
- Other Communities: Students, Schools, Families, etc.
- Centennial Museum
- School
- Lesson Plans
- Science Circus Day
- Reflections
## Course Schedule

*Changes may be made during the classes. Students should follow the latest changes.

<table>
<thead>
<tr>
<th>No</th>
<th>Date</th>
<th>Topic</th>
<th>Activities</th>
<th>Due</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Jan 22</td>
<td>Syllabus review, Blackboard</td>
<td>1. Lecture, 2. Group discussions</td>
<td></td>
<td>Syllabus</td>
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<tr>
<td>02</td>
<td>Jan 29</td>
<td>TEKS</td>
<td>1. Lecture, 2. Group discussions</td>
<td></td>
<td>TEKS</td>
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<tr>
<td>03</td>
<td>Feb 05</td>
<td>Centennial Museum Visit</td>
<td>1. Museum Overview, 2. Find a topic for your lesson plan 1 (bring TEKS)</td>
<td>Due: Science Teaching Philosophy (template 01)</td>
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<tr>
<td>04</td>
<td>Feb 12</td>
<td>Concept maps</td>
<td>1. Lecture, 2. Group discussions</td>
<td>Due: Reflection on Centennial Museum Visit (template 02)</td>
<td>Reading 1</td>
</tr>
<tr>
<td>05</td>
<td>Feb 19</td>
<td>Science Inquiry and 5 E Model</td>
<td>1. Lecture, 2. Group discussions</td>
<td></td>
<td>Reading 2</td>
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<tr>
<td>06</td>
<td>Feb 26</td>
<td>Guided Inquiry</td>
<td>1. Lecture, 2. Group discussions</td>
<td>Due: Lesson Plan 1 (template 03)</td>
<td>Reading 3</td>
</tr>
<tr>
<td>07</td>
<td>Mar 05</td>
<td>Virtual Science Circus Day</td>
<td>Three merit presentations (Group 1, 2, 3), Three critic presentations (Group 3, 1, 2)</td>
<td>Due: Merit Powerpoint 1, Due: Critic Powerpoint 1</td>
<td>Reading 4</td>
</tr>
<tr>
<td>08</td>
<td>Mar 19</td>
<td>Science Circus Day 1 on Mar 19 from 12:00pm-2:50pm (Centennial Museum)</td>
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<tr>
<td>09</td>
<td>Mar 26</td>
<td>Representation 1</td>
<td>1. Lecture, 2. Group discussions</td>
<td>Due: Reflection on the Science Circus Day 1 (template 04)</td>
<td>Reading 5</td>
</tr>
<tr>
<td>10</td>
<td>Apr 02</td>
<td>Blackboard online discussion (No face to face class)</td>
<td>Due: Improved Lesson Plan 1</td>
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<tr>
<td>11</td>
<td>Apr 09</td>
<td>Representation 2</td>
<td>1. Lecture, 2. Group discussions</td>
<td></td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>Apr 16</td>
<td>Assessments</td>
<td>1. Lecture, 2. Group discussions</td>
<td>Due: Lesson Plan 2 (template 05)</td>
<td>Reading 6</td>
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<tr>
<td>13</td>
<td>Apr 23</td>
<td>Virtual Science Circus Day</td>
<td>Three merit presentations (Group 3, 1, 2), Three critic presentations (Group 1, 2, 3)</td>
<td>Due: Merit Powerpoint 2, Due: Critic Powerpoint 2</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>Apr 30</td>
<td>Science Circus Day 2 on Apr 30 from 12:00pm-2:50pm (Centennial Museum)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>May 07</td>
<td>Sum up</td>
<td>1. Reflection, 2. Group discussions</td>
<td>Due: Reflection on the Science Circus Day 2 (template 06), Due: Self-and Peer-Assessments</td>
<td></td>
</tr>
<tr>
<td></td>
<td>May 14</td>
<td></td>
<td></td>
<td>Due: Improved Lesson plan 2, Due: Improved Teaching philosophy</td>
<td></td>
</tr>
</tbody>
</table>
Appendixes:

**Test Framework (Generalist 4-8) – Domain IV**

The course is designed to help students to become competent science teachers who can provide the best learning opportunities for their students. At the end of the course, successful students will develop the following competences:

1) Competency 036: The teacher understands how to manage learning activities to ensure the safety of all students
   - Understands safety regulations and guidelines for science facilities and science instruction.
   - Knows procedures for and sources of information regarding the appropriate handling, use, disposal, care and maintenance of chemicals, materials, specimens and equipment.
   - Knows procedures for the safe handling and ethical care and treatment of organisms and specimens.

2) Competency 037: The teacher understands the correct use of tools, materials, equipment, and technologies
   - Selects and safely uses appropriate tools, technologies, materials and equipment needed for instructional activities.
   - Understands concepts of precision, accuracy and error with regard to reading and recording numerical data from a scientific instrument.
   - Understands how to gather, organize, display and communicate at in a variety of ways (e.g., charts, tables, graphs, diagrams, written reports, oral presentations).

3) Competency 038: The teacher understands the process of scientific inquiry and the history and nature of science
   - Understands the characteristics of various types of scientific investigations (e.g., descriptive studies, controlled experiments, comparative data analysis).
   - Understands how to design, conduct and communicate the results of a variety of scientific investigations.
   - Demonstrates an understanding of potential sources of error in inquiry-based investigation.
   - Demonstrates an understanding of how to communicate and defend the results of an inquiry-based investigation.

4) Competency 056: The teacher has theoretical and practical knowledge about teaching science and about how students learn science
   - Understands how the developmental characteristics, prior knowledge and experience
   - Selects and adapts science curricula, content, instructional materials and activities to meet the interests, knowledge, understanding, abilities, experiences and needs of all students, including English-language learners.
   - Understands how to use situations from students’ daily lives to develop instructional materials that investigate how science can be used to make informed decisions.
   - Understands common misconceptions in science and effective ways to address these misconceptions.
   - Understands the rationale for the use of active learning and inquiry processes for students.
   - Understands questioning strategies designed to elicit higher-level thinking and how to use them to move students from concrete to more abstract understanding.
   - Understands the importance of planning activities that are inclusive and accommodate the needs of all students.
   - Understands how to sequence learning activities in a way that allows students to build upon their prior knowledge and challenges them to expand their understanding of science.

5) Competency 057: The teacher understands the process of scientific inquiry and its role in science instruction
• Plans and implements instruction that provides opportunities for all students to engage in non-experimental and experimental inquiry investigations.
• Focuses inquiry-based instruction on questions and issues relevant to students and uses strategies to assist students with generating, refining and focusing scientific questions and hypotheses.
• Instructs students in the safe and proper use of a variety of grade-appropriate tools, equipment, resources, technology and techniques to access, gather, store, retrieve, organize and analyze data.
• Knows how to guide students in making systematic observations and measurements.
• Knows how to promote the use of critical-thinking skills, logical reasoning and scientific problem solving to reach conclusions based on evidence.
• Knows how to teach students to develop, analyze and evaluate different explanations for a given scientific result.
• Knows how to teach students to demonstrate an understanding of potential sources of error in inquiry-based investigation.
• Knows how to teach students to demonstrate an understanding of how to communicate and defend the results of an inquiry-based investigation.

6) Competency 058: The teacher knows the varied and appropriate assessments and assessment practices to monitor science learning in laboratory, field, and classroom settings
• Understands the relationships among science curriculum, assessment and instruction and bases instruction on information gathered through assessment of students’ strengths and needs
• Understands the importance of monitoring and assessing students’ understanding of science concepts and skills on an ongoing basis
• C. Understands the importance of carefully selecting or designing formative and summative assessments for the specific decisions they are intended to inform.
• Selects or designs and administers a variety of appropriate assessment methods (e.g., performance assessment, self-assessment, formal/informal, formative/summative) to monitor student understanding and progress.
• Uses formal and informal assessments of student performance and products (e.g., projects, lab journals, rubrics, portfolios, student profiles, checklists) to evaluate student participation in and understanding of the inquiry process.
• Understands the importance of sharing evaluation criteria and assessment results with students.
Guidance for Evaluating Lesson Plans

This following checklist provides basic information to guide your lesson plan evaluation. You may generate your merit and critic reports/presentations in terms of this general checklist. However, each lesson plan has its own strengths and weaknesses, you are encouraged to evaluate lesson plans by analyzing its own characteristics.

1. Does this lesson plan correspond to TEKS? For which grade?
2. Are goals well defined and appropriate for these students?
3. Are activities properly designed for achieving these goals?
4. Does this lesson plan provide resources (e.g., equipment, space, time) for science inquiry activities?
5. Does this lesson plan provide instructions for facilitating students’ science inquiry skills?
6. Do activities enable students to connect with the goals in personally meaningful ways?
7. Does the plan allow students to rehearse the skills required for this lesson?
8. Is the cognitive demand on students appropriate?
9. Do the subject matter cognitive demands allow students to connect their prior knowledge?
10. Are the materials in the lesson plan comprehensible?
11. Does the lesson plan provide sufficient information about how to prepare equipments and activities for students?
12. Is there sufficient use of visuals (e.g., realia, graphic organizers, etc.)?
13. Does the lesson take into account students’ native languages and cultures?
14. How are students’ speaking, listening, reading, and writing integrated into the lesson?
15. Do materials and activities take into account the learning styles of students?
16. Is there opportunity for students to ask questions and interact with material and other students?
17. Is there any assessment? Are they appropriate for students?
18. Do lessons include a variety of activities, materials and teaching methods?
19. Does the lesson plan articulate possible teaching or learning difficulties? Is there any solutions for these difficulties?
20. Are differences among students addressed? (visual, oral, diversity, students with special needs, ESL).

Grading Rubric for “Merit and Critic Presentations” on Lesson Plans

<table>
<thead>
<tr>
<th>Clarity</th>
<th>Excellent (76-100%)</th>
<th>Great (51%-75%)</th>
<th>Acceptable (26-50%)</th>
<th>Not acceptable (0-25%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>The presentation is well-structured, clear and easy to follow</td>
<td>The majority of the presentation is easy to follow</td>
<td>The majority of the presentation is unclear and confusing</td>
<td>The presentation has no structure and difficult to follow</td>
</tr>
</tbody>
</table>

| Fruitfulness     | The presentation includes more than 10 merits/demerits and suggestions to support the lesson plan evaluation | The presentation includes 6-10 merits/demerits and suggestions to support the lesson plan evaluation | The presentation includes 3-5 merits/demerits and suggestions to support the lesson plan evaluation | The presentation includes 1-2 merits/demerits and suggestions to support the lesson plan evaluation |

| Validity         | These points are well supported with solid arguments and elaborations | The majority of these points are well-articulated | The majority of these points are not well-articulated | These points are not articulated and not convincing |

Grading Rubric for “Lesson Plans (Science Circus Day)”
<table>
<thead>
<tr>
<th></th>
<th>67-100%</th>
<th>34-66%</th>
<th>0-33%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Lesson Title</td>
<td>- The title is intriguing, succinct and represents the lesson plan</td>
<td>- The title is intriguing and represents the lesson plan</td>
<td>- The title is intriguing but does not represent the lesson plan</td>
</tr>
<tr>
<td>2. Grade</td>
<td>- The lesson plan is suitable for the grade identified</td>
<td>- There are some concerns of the use of the lesson plan for this grade</td>
<td>- The lesson plan is not suitable for the grade identified</td>
</tr>
<tr>
<td>3. Time</td>
<td>- Time is appropriate</td>
<td>- Time is some what inappropriate</td>
<td>- Time is not described or inappropriate</td>
</tr>
<tr>
<td>4. Learning objectives</td>
<td>- Concise descriptions of what learners are expected and able to do by the end of the lesson</td>
<td>- Descriptions of what learners are expected to learn are general. Most action verbs in the objective statements are from either lower or higher order thinking levels that do not address different cognitive levels. - Fail to show connection with the assessment section.</td>
<td>- The description of the learning objectives is vague. Action verbs in the objective statements do not support meaningful learning.</td>
</tr>
<tr>
<td>5. TEKS alignment</td>
<td>- Listed standards reflect the grade level, concepts and skills of the lesson plan. - There is evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.</td>
<td>- Listed standards reflect the grade level and the concepts of the lesson plan. - Partial evidence (i.e., in the assessment section) that student’s learning is linked to the components of the listed standards.</td>
<td>- Lesson is loosely connected to the standards.</td>
</tr>
<tr>
<td>6. Concept map</td>
<td>- Provide concept map that accurately present the relationship of scientific concepts involved in this lesson plan - Provide concepts and linking words</td>
<td>- Provide concept map that somewhat present the relationship of scientific concepts involved in this lesson plan - Only provide concepts or linking words</td>
<td>- Provide concept map that does not accurately present the relationship of scientific concepts involved in this lesson plan</td>
</tr>
<tr>
<td>7. Materials in the Centennial Museum</td>
<td>- Names and pictures are accurately listed</td>
<td>- Names and pictures are listed</td>
<td>- No names or pictures are accurately listed</td>
</tr>
<tr>
<td>8. Self-Created Materials</td>
<td>- Required tools and resources are listed. - Reference in procedures are clearly defined as to they are to be utilized</td>
<td>- Most of the required resources and materials are listed. - Some reference or clear definition in procedures.</td>
<td>- Some citing of resources through the lessons; materials listed but not included in the procedures.</td>
</tr>
<tr>
<td>9. Safety considerations</td>
<td>- Safety concerns are discussed; suggestions or solutions for addressing these safety concerns are provided</td>
<td>- Safety concerns are discussed</td>
<td>- Safety concerns are not discussed</td>
</tr>
<tr>
<td>10. Scientific Topics</td>
<td>- Topics show sequence and progression. - The descriptions of these topics are fully introduced - Opportunities are provided for students to link daily work to past and upcoming content/skills.</td>
<td>- Topics show somewhat sequence and progression. - The descriptions of these topics are provided - Opportunities are provided for students to link daily work to past and upcoming content/skills.</td>
<td>- Topics does not consider the proper sequence and progression - No descriptions of these topics are provided - No relevant connections to students’ daily life</td>
</tr>
<tr>
<td>11. Opening Activity</td>
<td>- Lessons include activities to “hook” the student into the day’s lesson, and are engaging and relevant. - The cited activity relates to the lesson objectives, and organizes principles or information that is to follow. - Lesson/s includes a variety of opening activities.</td>
<td>- Lessons are logically sequenced, so that learning builds progressively; connections between lessons are clearly made. - Very few warm-ups are provided - The cited activity relates to the objectives of the lesson. - Lessons always start with the same opening activity.</td>
<td>- Lessons do not have a logical sequence. Little opportunity to check for students’ understanding, no warm-ups are included in the lesson - Lesson/s does not include an opening activity.</td>
</tr>
</tbody>
</table>
12-14. Practice for the targeted, younger, older audience

- The lesson plan describes (i.e., during a cooperative learning time, or at the explanation stage of the Learning Cycle) the way in which the teacher will employ strategies (i.e., lecture, film, pictures) to provide the information needed for students to gain knowledge or skills.
- The lesson plan describes the activities the students will practice to demonstrate their mastery of the new learning (concepts/skills).
- The lesson plan informs the level of mastery the teacher will determine as she/he walks around the room assisting students.
- The lesson plan informs the activities that will serve as ‘reinforcement practice’ so that the new concept/s are not forgotten.
- Reinforcement practice are planned to be practiced after students have understand the new concepts.
- The lesson plan describes the reinforcement practices (i.e., homework, individual or group work in class).

15-17. Assessments for the targeted, younger, older audience

- Assessment tools are designed to address instructional objectives and standards.
- Assessment practices are open-ended, engaging and relevant.
- There are indications of assessment modifications to accommodate students with special needs.
- Assessments are linked to objectives and standards.
- There is no variety of assessment practices.

18. Reference

- More than five references are cited
- Reference sources are indicated and cited clearly
- Three to five references are cited
- Reference sources are indicated and cited clearly
- One to two references are cited
- Reference sources are indicated and cited vaguely

19. Mechanics of English

- Appropriate expression of concepts, varied and accurate vocabulary, no errors occur with regards to grammar, conventions and spelling.
- Lesson plans are consistent in format
- Clear expression and vocabulary, some mechanical errors exist but not to get in the way of understanding.
- Lesson plans have some formatting problems.
- Some mechanical errors exist but not to get in the way of understanding.
- Many errors with regards to grammar, spelling, and conventions.
- There is no obvious formatting structure

Grading Rubric for “Science Teaching Philosophy”

MSED4311 (CRN21778) Syllabus, Spring, 2014, Dr. Pei-Ling Hsu
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent (67-100%)</th>
<th>Satisfactory (34-66%)</th>
<th>Underperform (0-33%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Philosophy of science teaching statement is 300-500 words</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Philosophy statement addresses:</td>
<td></td>
<td></td>
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<tr>
<td>• your beliefs about science education</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• teaching and learning in formal and informal settings</td>
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<tr>
<td>• interactions in the science classroom (student-student and student-teacher)</td>
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<tr>
<td>3. The tone in your philosophy statement is:</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• Reflective</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Personal (in your writing you use the ‘I’ instead of the third person) and</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>• Clear</td>
<td></td>
<td></td>
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<tr>
<td>4. Autobiography as a science learner is 300-500 words</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>• Detailed and reflective descriptions of your experiences as a science learner</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Mechanics of Standard English</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Appropriate expression of concepts, varied and accurate vocabulary, no mechanical errors.</td>
<td></td>
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</tr>
</tbody>
</table>

**Grading Rubric for “Reflection on Museum Visit”**

<table>
<thead>
<tr>
<th>Criteria</th>
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<th>Satisfactory (34-66%)</th>
<th>Underperform (0-33%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Content</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Facts</td>
<td>Accurate and detailed descriptions of facts happened in the museum visit</td>
<td>Rough descriptions about the museum visit</td>
<td>Unclear and distorted descriptions about the museum visit</td>
</tr>
<tr>
<td>Feelings</td>
<td>Informative expression of your feelings about the museum visit</td>
<td>Rough expression of your feelings about the museum visit</td>
<td>Unclear expression of your feelings about the museum visit</td>
</tr>
<tr>
<td>Questions</td>
<td>Reflective and meaningful questions generated from the museum visit</td>
<td>Relevant questions generated from the museum visit</td>
<td>No reflective or irrelevant questions generated from the museum visit</td>
</tr>
<tr>
<td>Ideas</td>
<td>Insights generated and lessons learned from the museum visit</td>
<td>Rough descriptions about what you learn from the museum visit</td>
<td>Unclear descriptions about what you learn from the museum visit</td>
</tr>
<tr>
<td>Format</td>
<td>Mechanics of English</td>
<td>-Appropriate expression of concepts, varied and accurate vocabulary, no errors occur with regards to grammar, conventions and spelling. -Reflections are consistent in format (e.g., double space, font size 12 with 1 inch margins, cited references when included follow the APA format).</td>
<td>-Clear expression and vocabulary, some mechanical errors exist but not to get in the way of understanding. -Reflections have some formatting problems.</td>
</tr>
</tbody>
</table>

**Grading Rubric for “Reflection on Science Circus Day”**

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Excellent (67-100%)</th>
<th>Satisfactory (34-66%)</th>
<th>Underperform (0-33%)</th>
</tr>
</thead>
</table>
Content | Facts | Accurate and detailed descriptions of facts happened in the Science Circus Day | Rough descriptions about the Science Circus Day | Unclear and distorted descriptions about the Science Circus Day
---|---|---|---|---
Feelings | Informative expression of your feelings about the Science Circus Day | Rough expression of your feelings about the Science Circus Day | Unclear expression of your feelings about the Science Circus Day
Questions | Reflective and meaningful questions generated from the Science Circus Day | Relevant questions generated from the Science Circus Day | No reflective or irrelevant questions generated from the Science Circus Day
Ideas | Insights generated and lessons learned from the Science Circus Day | Rough descriptions about what you learn from the Science Circus Day | Unclear descriptions about what you learn from the Science Circus Day
Format | Mechanics of English | -Appropriate expression of concepts, varied and accurate vocabulary, no errors occur with regards to grammar, conventions and spelling. -Reflections are consistent in format (e.g., double space, font size 12 with 1 inch margins, cited references when included follow the APA format). | -Clear expression and vocabulary, some mechanical errors exist but not to get in the way of understanding. -Reflections have some formatting problems. | -Some mechanical errors exist but not to get in the way of understanding. -Many errors with regards to grammar, spelling, and conventions. -There is no obvious formatting structure

**Collaborator Information**

- **Centennial Museum**
  500 West University Avenue (UTEP), (915) 747-5565, Tuesday - Saturday (10am to 4:30pm)

- **Western Hills Elementary**
  530 Thunderbird Drive, (915) 774-4060

**Disabilities**

Individuals with disabilities have equal rights and opportunities to learn. If you need any accommodations for this particular course, you are encouraged to make an appointment with me to discuss specific needs or assistances for your learning. If you require more accommodations, you can also contact the Disabled Student Services Office in the East Union Bldg., Room 106. Web: [http://sa.utep.edu/dsso/](http://sa.utep.edu/dsso/); Phone: (915) 747-5148; E-Mail: dss@utep.edu

**Dishonesty and Plagiarism**

Dishonesty and plagiarism violate scholastic integrity and are subject to discipline. According to the UTEP Handbook of Operating Procedures (HOP, Section II, 1.3.1): “Any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes, but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.” Recognizing various forms of plagiarism is the first step to avoid plagiarism. You can learn different types of plagiarism in this website: [http://www.plagiarism.org/](http://www.plagiarism.org/)