Division: Teacher Education       Program Area: Science Education
Course #: ELE 3500   Section #: 002 CRN#:20475   Term/Year: Winter 2014
Course Title: Teaching Science: Preprimary - 8
Course Credit: Three Semester Hours
Course Location: 253 EDUC
Days: Thursdays       Time: 5:00-7:45 PM
Instructor: Dr. David Grueber
Office: Room 287   Mailbox: South Office Corridor
Office Hours: Wednesday 3-5 PM; Thursday 2-5 PM
Office Phone #: 313-577-0928
Secretary: Saundra Sumner
            313-577-0991- voice (Leave detailed message and return #)
Email:       grueber@wayne.edu       Website: http://blackboard.wayne.edu/

Course Description:

Catalogue description: This course will address goals and significant areas of study in the elementary school science curriculum. The course will introduce teachers to resources including science activities, field trips, print and non-print materials.

Specifically, this course prepares pre-service teachers to select existing and/or develop original inquiry-based and constructivist teaching models that promote student concept understanding and process skill development, as directed by our state science education standards. These curriculum models will demonstrate pre-service teachers’ knowledge of student learning and development, and incorporate the use of technology, multicultural and exceptional learner instructional strategies, authentic assessments, and the integration of subjects across the curriculum.

Course Outcomes:

1. To gain understanding of the nature of science so we may be prepared to teach science in a way that is consistent with the discipline.

2. To analyze the purposes of education, and of major science education initiatives.

3. To gain understanding of student learning and the appropriate science concepts to teach elementary and middle school students.
4. To analyze, select, and create inquiry-based lessons and units with a model that is consistent with the nature of science, the purposes of science education, and how children learn.

5. To develop an understanding of science as an integrated discipline and be able to develop standards-based science lessons which are thematic and integrated with subjects in the elementary school curriculum.

6. To implement science teaching that incorporates knowledge of student diversity, multicultural issues, exceptional learners, technology, and authentic assessments.

7. To apply the National Science Education Standards and Michigan GLCE’s in selecting and developing high quality teaching and learning experiences for elementary/middle school students.

8. To function as science teaching professionals by critically analyzing science education lessons and literature (research articles, practitioner articles, curricula, Internet sites), participating in professional organizations, and contributing to national, state or local school science education activities (science fairs and competitions, science museums).

**Required Text and Readings:**

1. **Required Textbook**

2. **Required Readings**
   - **Handouts and Internet addresses** as distributed during class meetings and/or posted on the ELE 3500 Blackboard site.
   - *Michigan State Science Grade Level Content Expectations (GLCEs)*. Available at [http://www.michigan.gov/mde/0,4615,7-140-28753_64839_38684_28760_49215---,00.html](http://www.michigan.gov/mde/0,4615,7-140-28753_64839_38684_28760_49215---,00.html)

3. **Recommended Readings**

**Policies**

**Attendance:** Each class meeting is almost three hours long and a large amount of material is covered during this time. Thus, regular attendance is expected. Absences will be excused under certain circumstances such as illness or death in the family. You are responsible for providing the instructor with such evidence. Excused absences will be by note from doctor or other relevant official. Absentees are responsible for: (1) getting any handouts passed out during the missed class, (2) any in-class announcements, (3) changes in syllabus, and (4) material discussed in class. There will be no make-up of activities missed. **Please arrive to class on time. Class announcements are given at the beginning of class, which you will miss if arriving late. Late arrivals are also disruptive to everyone in class.**

*Cancellations of Class & “Snow/No-Power” Policy* If, for any reason, the University cancels class, I will post an announcement in Blackboard, attempt to notify students through CAMPUS e-mail and inform the secretary (Saundra Sumner 313/577-0991) If Campus is open, expect to attend class. If I make it to campus, we will have class. (Campus News line: (313)577-5345 or www.wayne.edu) See above responsibilities of absentees. (Macomb Campus 586-445-7800)

No Cell phone/text device use during class time; please turn cell phone off/silent mode before entering class. Smart Phones/PDAs/Laptops must be off unless necessary for assigned class work; Printing available in Computer Lab. **Downloading from blackboard and printing should be done outside of class time.**

**Course Communication:** Class communication will utilize Blackboard and the class email list. Students MUST be able to access the course Blackboard site to retrieve important information about the course, as well as email messages. This syllabus will be posted on the Blackboard site, along with assignment details and other communications. Some assignments will include reading response postings. The site may be entered through [http://blackboard.wayne.edu](http://blackboard.wayne.edu). WSU provides free email and Internet accounts for students. You are responsible for providing the instructor with a valid e-mail contact if you do not use the Campus IPO.

**Plagiarism:** Plagiarism includes copying material (any more than 5 consecutive words) from outside texts or presenting outside information as if it were your own by not crediting authors through citations. It can be deliberate or unintended. **If you are in doubt about the use of a source, cite it.** Students caught plagiarizing information from other sources will receive a failing grade in the course. University policy states that students can be subject to multiple sanctions, from reprimand to expulsion as a consequence of academic dishonesty. **To enforce this policy, all outside references must be submitted with assignments.**

**Attention Students with Disabilities:**
Wayne State University is committed to providing students with disabilities an equal opportunity to benefit from its programs, services, and activities. If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only).
ELE 3500 Syllabus January 3, 2014

Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services’ mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible. http://studentdisability.wayne.edu/

**Religious Observance Policy:**
Because of the extraordinary variety of religious affiliations represented in the University student body and staff, the Wayne State University calendar makes no provision for religious holidays. It is University policy, however, to respect the faith and religious obligations of the individual. Students who find that their classes or examinations involve conflicts with their religious observances are expected to notify their instructors well in advance so that alternative arrangements may be worked out.

**Grading Policies**

*Class Participation* Students will be graded on class participation, which includes contributions to class discussion and activities, attendance, on-time arrival to class and remaining for the duration of class, timely completion of individual and group assignments, and other affective variables related to course work. The instructor will monitor student participation throughout the course. Each activity done during class will be part of your participation grade. Your final grade will be affected significantly if attendance in class is poor (5 pts. per class, 3 pts. if late or leaving early, 0 pts. for absence). The expectation is that you attend every class.

*Final Grade* The final grade is calculated from the various individual assignment grades, class participation, and response to readings. These categories will be weighted by value:

<table>
<thead>
<tr>
<th>Category</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Assignments</td>
<td>50%</td>
</tr>
<tr>
<td>Reading Responses</td>
<td>25%</td>
</tr>
<tr>
<td>Attendance &amp; Participation</td>
<td>25%</td>
</tr>
</tbody>
</table>

Points/percentages will be recorded in blackboard to help you keep track of your progress throughout the semester and may not reflect the value weighting. All assignments are important, therefore all grades are important. **There is NO Final Exam in this course; however, students who have not yet passed the MTTC test with a science major will be required to complete the MTTC Test Preparation Session on the scheduled exam day.**

**Regarding a Grade of Incomplete:** I do not give grades of incomplete (I) unless a student faces special circumstances such as grave illness or family tragedy that prevent the student from completing a portion of the required work. At the time of the occurrence, the student must be in good standing in order for a grade of incomplete to be considered. Under these circumstances, the student must make arrangements with the instructor in order to fill out a “contract” in which the student’s responsibilities are stipulated and agreed upon. Incompletes will revert to a failing grade after one calendar year, there will be no extensions.

**General Note:** The College of Education Faculty members strive to implement assessment measures that reflect a variety of strategies in order to evaluate a students’ performance in a
course. For undergraduates **C grades will be awarded for satisfactory work** that satisfies all course requirements. **B grades will be awarded for very good work** and **A grades will be reserved for outstanding performance**. Please note that there is a distribution of grades from A – F within the College of Education and that plus and minus is recorded and distinguish distinct grade point averages.

**Grades will be assigned as follows:**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>93-100 %</td>
<td>A</td>
</tr>
<tr>
<td>90-92 %</td>
<td>A-</td>
</tr>
<tr>
<td>87-89%</td>
<td>B+</td>
</tr>
<tr>
<td>83-86 %</td>
<td>B</td>
</tr>
<tr>
<td>80-82 %</td>
<td>B-</td>
</tr>
<tr>
<td>77-79 %</td>
<td>C+</td>
</tr>
</tbody>
</table>

Less than 60% = F

**Withdrawal Policy:**

Students who withdraw from a course after the **end of the 10th** week of class (Saturday, March 22) will receive a grade of WP, WF, or WN.

- WP will be awarded if the student is passing the course (based on work due to date) at the time the withdrawal is requested
- WF will be awarded if the student is failing the course (based on work due to date) at the time the withdrawal is requested
- WN will be awarded if no materials have been submitted, and so there is no basis for a grade

Students must submit their withdrawal request on-line through Pipeline. The faculty member must approve the withdrawal request before it becomes final, and students should continue to attend class until they receive notification via email that the withdrawal has been approved. Withdrawals can be requested at any point from the fifth week of class through the study day.

**MTTC Tests - Michigan Test for Teacher Certification**

In the state of Michigan, a pre-service teacher must take and pass a test in each of the content areas in which s/he plans to be certified. At Wayne State University, passing the MTTC tests is a requirement to the student teaching field experience. As a result, it is imperative that pre-service teachers prepare for the tests. There are a number of resources available to teachers to help them prepare for the tests.

1. Check the MTTC Tests website, (link made available in Blackboard) http://www.mttc.nesinc.com/ - to find out test schedules, how to register for the tests, test objectives and other pertinent information.

2. Study for the tests. Even if you have a major in a subject area, you need to review the material in order to pass the tests. Basic information in the content area is usually tested, reviewing a basic textbook in your content area (e.g., integrated science, math) and the concepts related to that specific test’s objectives will maximize the chances of succeeding. Also, do an online search for textbooks in your particular area.

In addition to reviewing the material from a basic textbook, study guides are excellent resources to prepare for these tests. The following websites have study guides that students may purchase at an affordable price:

- Teaching Solutions - [http://www.teachingsolutions.org/mttc.html](http://www.teachingsolutions.org/mttc.html) - has great study guides that you can download directly into your computer. Unfortunately they have not yet developed a study guide for Integrated Science.
Amazon also has a variety of study guides -
http://www.amazon.com/s/?ie=UTF8&keywords=mttc+study+guides&tag=googhydr-20&index=aps&hvadid=1147468841&ref=pd_sl_9caca812mo_b

3. Register and complete a practice test. Wayne State offers reimbursement of the $29 fee for the practice exam offered by the state. (http://www.mttc.nesinc.com/MI_viewPT_opener.asp)
Remember the key to passing the tests is preparation. The sooner you pass the tests the sooner you will be able to get your teaching certification.

- An MTTC Test Preparation and Practice Session will be scheduled for Final Exam day, to be completed online, in Blackboard, counted as part of participation score.

**Course Assignments:**
The instructor will provide criteria and a grading rubric for each assignment. (Available in Blackboard) These criteria should be used as guidelines for what the instructor expects in each assignment. **Late assignments will decrease in point value by 5% of the allocated points up to a maximum of 30% for each day the assignment is late.** To meet professional quality and presentation standards required of practicing teachers, assignments will be graded on clarity of ideas, grammar, spelling, and adequate word choice. **Assignments must be submitted through Blackboard as a word document. If the Instructor cannot access your work, it will be considered LATE.**

**Reading Response:** Required readings from the text and other resources will be evaluated by your response submitted as a **Reading Response** post through Blackboard.
**For each Reading Response Assignment.** (Except #2), you must make two or more posts. Your thread must answer the question(s), and then reply as a “critical friend” to another posting within the forum.
Your Postings will be assessed for:
- **Content (50%):** A substantive answer to the question(s), showing clear evidence of understanding the reading material.
- **Organization (20%):** Logical progression of ideas, Minimum 2 paragraph response to question and discussion on another thread post.
- **Conventions (30%):** APA style, grammar, spelling, required citations, on time.

**Assignment 1: Educational Resources**
This assignment includes two parts:

1. Use the Internet to find at least three sources of grants for science teachers and provide the following information for each source:
2. Use the following website to locate the Math/Science Center that supports the school district in which you live or teach: http://www.mscenters.org/
   1. Visit the Math/Science Center.
   2. Construct one of the suggested workshop projects, or your own idea.

**Assignment 2: Learning Cycle Journal**
Students will observe an example of a teaching cycle presented by the instructor, then prepare a formal lesson plan for the teaching cycle performed in class. The eligible teaching cycles will be announced in class and are listed in the Course Documents under “Instructor Learning Cycles”.
Rubrics are available in Blackboard, under Assignment #2.
The Learning Cycle Journals have two parts:
Part 1: Write a Formal Lesson Plan for the teaching cycle.

Part 2: Write a 2-3 page discussion paper.

Assignment 3: Informal Education Setting Learning Plan
The class will be visiting the Detroit Zoo on a scheduled class field trip as part of this assignment.

- Choose a content GLCE, visit an informal education setting (Cranbrook, the Detroit Zoo, etc.), create a Formal WSU Lesson Plan for students to complete an activity in the informal setting, include an itinerary for the program, outline the cost of the program, and how you might justify the expense and/or raise the funds.

Assignment 4: Science Lit Kit- Trade Book Based Science Curriculum Package

- Obtain a science-oriented trade book, prepare and bring to class a Science Curriculum Package in a sturdy, secure container able to hold ALL the contents.
- Submit a written a report in blackboard including an overview of scientific concepts/principles addressed, Scientific Process Skills Utilized, GLCEs and objectives addressed, teacher guide, student guide, and references used in developing the project.

Assignment 5: Unit Plan Group Project

- As part of a group, select a science concept from Elementary science GLCEs and develop unit plan based on the concept.
- Prepare lesson plans for your unit.
  *Each person must contribute one complete lesson plan to the unit, including rubrics for all assessments utilized, lesson closing or transition to next lesson.
- Prepare a Students’ guide (workbook) for your unit (At least one per observing group).
- Make a teaching presentation of this lesson to the class.
  *Your group will be required to perform demonstrations and classmates will participate in the unit activities (either cooperative group setting or station-to-station learning).
  *Materials are limited here in the stockroom; make sure you have chosen activities that utilize easy to find materials (you may need to purchase some items).
- Each individual is also required to submit a self/ individual group reflective evaluation to help assess individual participation within each group, as part of the final unit plan.
- Submit Final Report including teacher guides, student workbook with answer key, all objectives, benchmarks, background information, rationale, resource citations, and self/group reflective evaluation of own group to course instructor, within one day after presentation to the class.

Each individual will be graded on individual participation within the group and contributions toward:

1. Presentation of the Unit.

Rubrics are available in Blackboard.
**ELE 3500 Syllabus January 3, 2014**

**ELE 3500 Course Schedule**

You will be informed of changes to the scheduled topics and/or due dates should the necessity arise.

<table>
<thead>
<tr>
<th>Class Meeting</th>
<th>Topic of Discussion</th>
<th>Assignment DUE</th>
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<tbody>
<tr>
<td>January 9</td>
<td><strong>Introduction and Course Orientation</strong>&lt;br&gt;Review Syllabus&lt;br&gt;<strong>Review Directions - Assignment #1:</strong>&lt;br&gt;What is Science? Who is a Scientist?&lt;br&gt;Activities and Discussion</td>
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<tr>
<td>January 16</td>
<td><strong>Exploring Scientific Inquiry</strong>&lt;br&gt;What is Scientific Inquiry?&lt;br&gt;What are Science Process Skills?&lt;br&gt;What is Constructivism?&lt;br&gt;Activities and Discussion</td>
<td><strong>Due: Reading Response Assignment 1: Chapters 1 &amp; 5 The Nature of Science and Science Teaching</strong></td>
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<tr>
<td>January 23</td>
<td><strong>The National Standards, Michigan Benchmarks, GLCEs, and Curricula</strong>&lt;br&gt;Planning for Learning&lt;br&gt;Activities and Discussion (Chapter 3)&lt;br&gt;<strong>Learning Cycle Group Designations</strong>&lt;br&gt;Review Directions Assignment #5</td>
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<tr>
<td>January 30</td>
<td><strong>Learning Theories, Philosophy and Pedagogies</strong>&lt;br&gt;How People Learn&lt;br&gt;Activities and Discussion (chapter 2)</td>
<td><strong>Discussion Board Assignment 2:</strong>&lt;br&gt;Group submission for Assignment 5&lt;br&gt;<strong>Due: Reading Response Assignment 3: Chapters 2 &amp; 3</strong></td>
</tr>
<tr>
<td>February 6</td>
<td><strong>Experiencing Inquiry Part I</strong>&lt;br&gt;<strong>Review directions for Assignment #3:</strong>&lt;br&gt;<strong>Informal Learning Plan</strong>&lt;br&gt;Developing Inquiry-based Learning Cycles: Bernoulli’s Principle Lesson&lt;br&gt;Activities and Discussion</td>
<td><strong>DUE: Assignment #1: Educational Resources Assignment</strong>&lt;br&gt;Prepare to Journal this Learning Cycle; download and print assignment rubric, bring to class so you have a clear understanding of assignment expectations while journaling</td>
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<tr>
<td>February 13</td>
<td><strong>Informal Learning (Tentative)</strong>&lt;br&gt;Field Trip to Detroit Zoo&lt;br&gt;Science learning at zoos, museums, and in the field&lt;br&gt;Suggested reading before class pgs. 144-156.</td>
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<td>February 20</td>
<td><strong>Experiencing Inquiry Part II</strong>&lt;br&gt;Developing a learning cycle; Balance Lesson; Activities and Discussion</td>
<td><strong>Due: Reading Response Assignment 4:</strong>&lt;br&gt;Chapter 4 &amp; 6 Diverse Learners</td>
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<tr>
<td>February 27</td>
<td><strong>Experiencing Inquiry Part III:</strong>&lt;br&gt;Instructional Methods for Inquiry and Assessment/Evaluation&lt;br&gt;<strong>Review Directions for Assignment #4:</strong>&lt;br&gt;Science Lit Kit&lt;br&gt;Determining Variables, Graphic</td>
<td><strong>DUE: Assignment #2: Learning Cycle Journal Part I</strong></td>
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<td>Date</td>
<td>Topic</td>
<td>Due</td>
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<td>March 6</td>
<td><strong>Experiencing Inquiry Part IV</strong>&lt;br&gt;Mass, Volume, Density, the 5E learning cycle; Diverse Learners;&lt;br&gt;Activities and Discussion</td>
<td><strong>DUE: Assignment #2: Learning Cycle Journal Part II.</strong></td>
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<tr>
<td>March 20</td>
<td><strong>Instructional Methods for Inquiry</strong>&lt;br&gt;Classroom Management: Plan Ahead Materials, Students &amp; Their Parents&lt;br&gt;Integrating Science With Other Subjects; Problem Based Learning; Hand-washing, Health, Evolution; &amp; other Classroom Controversies: Activities and Discussion</td>
<td><strong>DUE: Assignment #3: Informal Learning Plan</strong>&lt;br&gt;<strong>Due: Reading Response Assignment 5: Chapters 7 &amp; 8 Inquiry Opportunities and Lifelong Learning</strong></td>
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<td>March 27</td>
<td><strong>Presentation Day; Science Literature Kits</strong></td>
<td><strong>DUE: Assignment #4: Student Presentation of Science Lit Kit, and Written Report</strong></td>
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<td>April 3</td>
<td>Pe<strong>er Teaching Lessons</strong></td>
<td><strong>DUE: Unit Plan Presentations</strong>&lt;br&gt;<strong>Submit entire Unit Plan Report electronically to instructor; bring one workbook (per group) and all materials necessary to conduct your activities per student group. Arrive for set-up prior to regular scheduled class start to ensure proper organization. Individual Self/Group Reflection is due within 24 hours upon completion of the Unit.</strong></td>
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<tr>
<td>April 10</td>
<td>Peer Teaching Lessons</td>
<td><strong>DUE: Unit Plan Presentations</strong></td>
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<tr>
<td>April 17</td>
<td>Peer Teaching Lessons</td>
<td><strong>DUE: Unit Plan Presentations</strong></td>
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<tr>
<td>April 24</td>
<td>MT<strong>TC Test Preparation &amp; Practice</strong></td>
<td>Practice Test &amp; feedback session provided in blackboard on-line environment.</td>
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