Early Childhood, Elementary, and Middle Level Education Department
ELE3290: Science in the Elementary School

Instructor: Brian Poelker
Office: BB 2155
Email: bpoelker@eiu.edu
Office Hours: MW 11:40a – 12:50p, 2:40p - 4:00p
Phone: 581-7896
Class Meetings: MW 8:00a – 9:40a, 10:00a – 11:40a, 1:00p- 2:40p

Unit Theme: Educators as Creators of Effective Educational Environments: Integrating diverse students, subjects, strategies, societies and technologies.

Catalog Description: Science in the Elementary School. This course encompasses the exploration of the nature, processes, and products of science and their relationships to society, the world, and the school curriculum. Field-based experiences will be in conjunction with ELE 4000.

Prerequisites: Concurrent enrollment in ELE 3340 and ELE 4880, or permission of department chair. University Teacher Education requirements apply and department requirements for enrollment must be met.

Purpose of the Course: To involve students in the process of learning about the nature of science; a sample of its content and the methods used to teach the content. Using theories of how children learn as a basis for instruction, the students develop their skills at teaching science processes through discovery, guided discovery, and inquiry lessons. Students will also understand the importance of assessment and evaluation, and will develop various means of assessment. **Students will integrate technology in their lessons, projects, and science units.**

Course Text:


Supplemental Materials
LiveText Account & Course packet.

Learning Model:
The Information-Processing Models
- Information-processing models emphasize ways of enhancing the human being’s innate drive to make sense of the world by acquiring and organizing data, sensing problems and generating solutions to them, and developing concepts and language for conveying them.


Dispositions: Teacher candidates in the Department of EC/ELE/MLE will exhibit professional ethical practices, effective communication, and sensitivity to diversity, the ability to provide varied teaching practices evidenced in a supportive and encouraging environment.

Live Text Assessment Requirement: For those classes with Live Text or Practicum- If the portfolio or Live Text requirements are rated, by the instructor, to have been completed in less than a satisfactory manner then no more than a "D" may be earned in the class regardless of the number of points earned.

Standards:
Course requirements and demonstrated competencies are aligned with the following standards:
- Association for Childhood Education International Standards (ACEI) [http://www.acei.org/Synopsis.htm](http://www.acei.org/Synopsis.htm)
- Illinois Professional Teaching Standards (IPTS) [http://www.isbe.state.il.us/profprep/PDFs/ipts.pdf](http://www.isbe.state.il.us/profprep/PDFs/ipts.pdf)
- Illinois Core Language Arts Standards (ICLAS) [http://www.isbe.net/profprep/CASCDvr/pdfs/24110_corelangarts_std.pdf](http://www.isbe.net/profprep/CASCDvr/pdfs/24110_corelangarts_std.pdf)
- Illinois Core Technology Standards (ICTS) [http://www.isbe.net/profprep/CASCDvr/pdfs/24100_coretechnology.pdf](http://www.isbe.net/profprep/CASCDvr/pdfs/24100_coretechnology.pdf)
### Course Outcomes

1. The students will exhibit a positive attitude toward providing meaningful experiences in science for young students.
2. The students will demonstrate an understanding of the nature of science, the learner, and the learning environment.
3. The students will demonstrate a working knowledge of appropriate science learning and hands-on inquiry experiences for children.
4. The students will exhibit the ability to effectively utilize various types of materials, resources, and media to engage children in meaningful science experiments.
5. The students will demonstrate knowledge of assessment and evaluation procedures for science.
6. The students will demonstrate the ability to plan, implement, and assess science instruction for elementary students.
7. The students will become familiar with the Illinois Learning Standards for Science and the National Science Education Standards.

### Course Requirements

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<thead>
<tr>
<th>Course Requirements</th>
<th>Demonstrated Competencies</th>
<th>Aligned Standards (ACEI, ELE, IPTS, ICTS, ICLAS)</th>
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<tbody>
<tr>
<td>Participation</td>
<td>Performance includes presence, participation and preparation for group and whole class discussions, and participation in lab activities working cooperatively with peers. Focus is on practices and behaviors that allow the learner to grow professionally.</td>
<td>ACEI 5.1&lt;br&gt; ELE 16, 17&lt;br&gt; IPTS 10, 11&lt;br&gt; ICTS 2E, 6C, 6D&lt;br&gt; ICLAS 2D, 2E, 2H&lt;br&gt; Dispositions: PEP, EC, SDE</td>
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<tr>
<td>Science notebook &amp; lab sheets</td>
<td>Performance includes organizing science notebook in order to create a useful teaching resource. This resource will include handouts, assignments, lab sheets, demonstration lessons and a detailed Table of Contents. Focus is on developing a professional resource that can be used to plan and implement developmentally appropriate lessons using inquiry-based activities.</td>
<td>ACEI 2.2&lt;br&gt; ELE 4&lt;br&gt; IPTS 1, 7, 10&lt;br&gt; ICTS 2B&lt;br&gt; ICLAS 2B&lt;br&gt; Dispositions: PEP, EC, PTS1</td>
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<tr>
<td>Readings &amp; written responses</td>
<td>Performance will include reading, reflecting, and preparing for discussion of content related to science teaching and learning (constructivism, inquiry, assessment, questioning, learning cycle model, developmentally appropriate practices, etc.) Focus is on increasing the participant’s knowledge and understanding of the learning theory and processes related to science teaching methods.</td>
<td>ACEI 2.2, 3.1, 3.3&lt;br&gt; ILSCSTF&lt;br&gt; IPTS 1&lt;br&gt; ICTS 2E, 7K&lt;br&gt; ICLAS 1E, 2B, 2D, 2F&lt;br&gt; Dispositions: PEP, EC</td>
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<td>Quizzes &amp; Tests</td>
<td>Tests will be provided as one form of assessment of student’s content knowledge related to planning and teaching effective science lessons. Focus is on demonstrating understanding of course content knowledge.</td>
<td>ACEI 2.2&lt;br&gt; ELE 4, 16&lt;br&gt; IPTS 1, 8&lt;br&gt; ICLAS&lt;br&gt; Dispositions: EC, PTS1</td>
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<td>Science Unit*</td>
<td>Performance includes creating a two-week science unit that is developmentally appropriate and inquiry based. The lesson plans will follow the learning cycle model. Lessons will allow elementary students to develop conceptual understanding. Appropriate informal and formal assessment activities will be included. Focus is on developing a developmentally appropriate inquiry-based science unit that fosters conceptual understanding.</td>
<td>IPTS 1, 2, 3, 4, 6, 7, 8, 10&lt;br&gt; ICTS 2E, 6A, 6C, 7J, 8A, 8D&lt;br&gt; ACEI 1, 2.2, 3.1, 3.2, 3.3, 3.4, 4, 5&lt;br&gt; NAEYC 4b, 4c, 4d&lt;br&gt; Dispositions:</td>
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<tr>
<td>Core Assignments</td>
<td>Brief Description</td>
<td>Points/Due Date</td>
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<td>Participation</td>
<td>Performance includes presence, participation and preparation for group and whole class discussions, and participation in lab activities working cooperatively with peers. Focus is on practices and behaviors that allow the learner to grow professionally.</td>
<td>5% 50pts</td>
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<td>10% 50 pts assignments TBA 50 pts Science Notebook 2 Dec.</td>
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<tr>
<td>Readings &amp; written responses (Textbook &amp; Journal Articles)</td>
<td>Select an article from a professional journal that corresponds with the relevant topic. Topics such as constructivism, inquiry-based learning, the learning cycle, using writing in science, authentic assessment, etc. Copy, read, highlight, and write reflective comments in the margins. Type a 1/2 to 1 page reflection that answers this question: What was the key idea presented in this article?</td>
<td>10% 100pts</td>
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<tr>
<td>Quizzes &amp; tests</td>
<td>A midterm and a final will be given over the course content.</td>
<td>15% 50 pts in class essays TBA 100 pts Final</td>
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<tr>
<td>Science Unit</td>
<td>An inquiry-based science unit will be developed. The unit will include: topic research, teacher resources, student resources, and lesson plans following the learning cycle model.</td>
<td>30% 300 pts. TBA</td>
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<td>Demonstration lesson &amp; group presentation</td>
<td>Performance includes working cooperatively with peers to select demonstration lessons around a theme. Each demonstration lesson will foster inquiry. Performance will include demonstration understanding of the concept</td>
<td>15% 100 pts Lesson Plan 50 pts Presentations TBA</td>
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through effective questioning techniques for creating conceptual understanding and overall explanation of the concept. The lesson will be presented to peers and may include a presentation for elementary students.

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<th>Alternative Assignments</th>
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<th>Aligned Standards (ACEI, ELE, IPTS, ICTS, ICLAS)</th>
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<td>Performance in the alternative assignments promotes life-long learning. The alternative assignments require effective communication related to the experiences. Performance increases awareness of outside agencies, materials, and resources.</td>
<td>15% See below.</td>
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All or a portion of the Science Unit will be submitted through LiveText for Unit and Program Assessment.

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<td>Illinois Learning Standards &amp; National Science Education Standards Assignment (NSES) Included in Science Unit</td>
<td>Performance requires the students to be able to identify the three state science goals (11, 12, &amp; 13) ultimately being able to identify the standards taught in his/her science unit. The students will be comparing the content standards developed by NSES with the content standards in state goal 12, recognizing the content is divided into three categories: life sciences, physical sciences, &amp; earth and space sciences.</td>
<td>ACEI 2.2, 3.1, 5 ILSCTF-ELE 4, 10 IPTS 1, 4, 8 IPTS 3A, 6C, 8A ICLAS 3B</td>
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<td>Examine a professional science journal (Science &amp; Children, Science Scope, The Science Teacher, etc.) Included in Science Unit</td>
<td>Read the letter from the editor. What is his/her focus? Briefly describe the main features of the journal. Select one article to read. Write a brief summary. How could the classroom teacher use the information in this professional journal in his/her teaching? How could the classroom teacher use this information in her professional growth?</td>
<td>ACEI 2.2, 3.1, 3.3 ILSCTF IPTS 1 ICTS 2E, 7K ICLAS 1E, 2B, 2D, 2F</td>
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<td>Take Home labs 5% 50 pts 21 Sept.</td>
<td>Performance requires the students to conduct long term laboratory activities that necessitate daily data collection. The activities relate to weather and an experiment involving osmosis and include integration with internet resources and health sciences.</td>
<td>ACIE 2.2 ILSCTF-ELE 1, 4, 9, 12, 15 IPTS 1, 4 ICTS 3A, 3D, 6A, 8D</td>
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<td>Field Trips 10% 100 pts TBA</td>
<td>Performance includes interaction with outside agencies to enhance educational experiences for all students. Activities at the nature centers include the integration of handicapped students into the learning environment, investigating</td>
<td>ACIE 2.2, 3.2, 3.4 ILSCTF-ELE 1, 4, 9, 12, 15 IPTS 1, 3, 4, 6, 9 ICLAS 2H, 2B, 3B</td>
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environmental education, and methods of incorporating field studies as an integral part of the science curriculum.

Detailed instructions and expectations for each assignment will be provided by each individual instructor in his/her course syllabi.

**Grading Scale:** A=100-92%; B=91-83%; C=82-74%; D=73-65%; F=below 65%

### COURSE OUTLINE

| Week 1 | What is Science?  
Conceptions of Scientist & Science Attitudes Science  
Process Skills & Activities, National Science Education Standards & Illinois Learning Standards  
Science Content: Life Science, Physical Science, & Earth & Space Science |
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<tr>
<td>Week 2</td>
<td>Science Process Skills &amp; Activities using The Learning Cycle Model, Constructivism</td>
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<td>Week 3</td>
<td>Science Process Skills &amp; Activities using The Learning Cycle Model, Inquiry Based Learning</td>
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<td>Week 4</td>
<td>Science Process Skills &amp; Activities using The Learning Cycle Model, Authentic Assessment</td>
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<td>Week 5</td>
<td>Science Process Skills &amp; Activities using The Learning Cycle Model, Misconceptions</td>
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<td>Week 6</td>
<td>Student Team Presentations using The Learning Cycle Model</td>
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<td>Week 7</td>
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<td>Week 8</td>
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<td>Week 9</td>
<td>Science Process Skills &amp; Activities using The Learning Cycle Model</td>
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<td>Week 10</td>
<td>Science Process Skills &amp; Activities, The Importance of Questioning</td>
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| Week 11 | Science Process Skills & Activities, Scope & Sequence Charts  
Science Concepts  
Developing Clarity of Learning (The Essential Understanding: Understand, Know, Be Able to Do—skills) |
| Week 12 | Science Process Skills & Activities using The Learning Cycle Model |
| Week 13 | Demonstration Lessons (Discrepant Events)  
Other Science Teaching Strategies  
Simulations  
Project Based Learning |
| Week 14 | Resources Available for Teachers |

### ELE 3290 References


Revised Spring, 2009


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Students with Disabilities: If you have a documented disability and wish to discuss academic accommodations, please contact the Office of Disability Services at 581-6583.
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