

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

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Unit Theme: Educators as Creators of Effective Educational Environments

Catalog Description: Science in the Elementary School. 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 Elementary Education 4000.

Prerequisites & Notes: ELE3000 and six semester hours in science. Concurrent enrollment with ELE3340, ELE4880, and ELE4000 (practicum) is recommended.

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:

Martin, R., Sexton, S., Wagner, K., & Gerlovich, J. (2005). Teaching science for all children (4th ed.). Boston: Allyn and Bacon.
Carin, A. A., Bass, J. E., Contant, T. L. (2005). Activities for teaching science as inquiry (6th ed.). Upper Saddle River, NJ: Pearson, Merrill Prentice Hall.

Supplemental Materials

LiveText Account & Course packet.

Learning Model:

The Information Processing Family Models.

Joyce, B., Weil, M., & Calhoun, E. (2009). *Models of teaching*. (8th ed.). Boston: Pearson.

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>
- Illinois Standards for Certification in Special Teaching Fields-Elementary http://www.isbe.net/profprep/CASCDv1r/pdfs/26310_elementaryed.pdf
- Illinois Professional Teaching Standards (IPTS) <http://www.isbe.state.il.us/profprep/PDFs/ipts.pdf>
- Illinois Core Language Arts Standards (ICLAS) http://www.isbe.net/profprep/CASCDv1r/pdfs/24110_corelangarts_std.pdf
- Illinois Core Technology Standards (ICTS) http://www.isbe.net/profprep/CASCDv1r/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	Demonstrated Competencies	Aligned Standards (ACEI, ILSCSTF-ELE, IPTS, TSIT, LASIT)
Participation	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.	ACEI 5.1 ILSCSTF-ELE 16, 17 IPTS10, 11 TSIT 2E, 6C, 6D LASIT 2D, 2E, 2H
Science Notebook & lab sheets	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.	ACEI 2.2 ILSCSTF-ELE 4 IPTS 1, 7, 10 TSIT 2B LASIT 2B
Readings & written responses (Textbook & Journal Articles)	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.	ACEI 2.2, 3.1, 3.3 ILSCSTF IPTS 1 TSIT 2E, 7K LASIT 1E, 2B, 2D, 2F
Quizzes & Tests	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.	ACEI 2.2 ILSCSTF-ELE 4,16 IPTS 1, 8 LASIT
Science Unit*	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.	IPTS 1, 2, 3, 4, 6, 7, 8, TSIT 2E, 6A, 6C, 7J, 8A, 8D ACEI 1, 2.2, 3.1, 3.2, 3.3, 3.4, 4, NAEYC 4b, 4c, 4d,
Demonstration Lesson & Group Presentation	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 through effective questioning techniques for creating conceptual understanding and overall explanation of the concept.	ACEI 1, 2.2, 3.2, 3.3, ILSCSTF-ELE 4 IPTS 1, 3, 4, 6, 7 TSIT 7A, 7D, 7J, 8D LASIT 1F, 2D, 2F
*LiveText Submission	All or a portion of the Science Unit will be submitted through LiveText for Unit and Program Assessment.	

Core Assignments	Brief Description	Approximate Weight
Readings & written responses (Textbook & Journal Articles)	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	100pts

	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?	
Tests	Essays and a final will be given over the course content.	200pts
Science Unit	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.	300pts
Science Notebook & lab sheets	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.	100pts
Demonstration Lesson & Group Presentation	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 through effective questioning techniques for creating conceptual understanding and overall explanation of the concept.	150pts
Alternative Assignment	Brief Description	Aligned Standards (ACEI, ILSCSTF-ELE, IPTS, TSIT, LASIT)
Illinois Learning Standards & National Science Education Standards Assignment (NSES)	Performance requires the students to be able to identify the three state science goals (11, 12, & 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, & earth and space sciences.	ACEI 2.2, 3.1, 5 ILSCTF-ELE 4, 10 IPTS 1, 4, 8 IPTS 3A, 6C, 8A LASIT 3B
Examine a professional science journal (Science & Children, Science Scope, The Science Teacher, etc.)	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?	ACEI 2.2, 3.1, 3.3 ILSCSTF IPTS 1 TSIT 2E, 7K LASIT 1E, 2B, 2D, 2F Included in Science Notebook
Take Home labs	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.	ACIE 2.2 ILSCTF-ELE 1,4, 9, 12, 15 IPTS 1, 4 TSIT 3A, 3D, 6A, 8D 50pts
Field Trips	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 environmental education, and methods of incorporating field studies as an integral part of the science curriculum.	ACIE 2.2, 3.2, 3.4 ILSCTF-ELE 1, 4, 9, 12, 15 IPTS 1, 3, 4, 6, 9 LASIT 2H, 2B, 3B 100pts

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