University of Arkansas at Little Rock
College of Education and Health Professions

Course Prefix and number:	ECED 3304
Course Title:	Integrated Science Methods (web-enhanced)
Credit	3 Undergraduate Semester Hours
Semester & Year:	Fall 2014
Instructor:	Keith R. Harris, M.AT.
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Office Hours:	Wednesdays 2:00PM - 4:00PM and by appointment
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I. Course Description:

This course involves planning and facilitating of research-based science teaching strategies, the selection and use of materials, and implementation of assessment theory and techniques. You will design and implement grade-level appropriate instructional activities by your understanding of what it means to know and learn science. Concurrent enrollment in ECED 3200 is required.
Through a dynamic process of investigation and collaboration and using the same process and technologies scientists, mathematicians, and engineers use, you will work in teams to formulate questions, make predictions, design investigations, collect and analyze data, make products and share ideas. Additionally, this course explores ways in which curriculum and technology are used in classroom settings to build relationships among teachers and students. You will learn how content and pedagogy combine to make effective teaching. THIS IS A WEB-ENHANCED COURSE.

II. Conceptual Framework:

1. To increase their confidence and comfort level for teaching science;
2. To acquire strategies for teaching science to students in grades PK-4;
3. To demonstrate an awareness of the developmental appropriateness of various science concepts for young children;
4. To demonstrate an understanding of state and national benchmarks as they relate to science teaching; and
5. To demonstrate skills in instruction of, curriculum development in, and assessment of, science standards for young children.

III. Science Competencies K-6

1. Fundamental Understanding of the integration of STEM

The teacher: understands and models key concepts of science, technology, engineering and math (STEM) (1.1). Develops and delivers STEM-integrated, authentic, student-centered lessons and lab investigations for students to collect, evaluate, synthesize and share real world data using safe science practices (1.2, 1.4, 1.9). Understands and applies STEM principles (including the engineering design process) to solve real- world problems in K-6 lessons; works collaboratively (1.3, 1.5). Develops and delivers STEM lesson assessments (formative and summative) using vocabulary, primary concepts and models (1.6, 1.7), Shares, models, and practices straits to support the integration of STEM areas with the emphasis in the K-6 classroom (1.10)

2. **Fundamental understanding of the vision for K-6 science education: scientific and engineering practices, cross cutting concepts, and core ideas**

   The teacher: demonstrates a command of the three dimensional vision for K-12 science education - students deepen their understanding of the core ideas in science and engineering by actively engaging in practices demonstrated in these fields over multiple years of school (2.1). Demonstrates a command of the eight scientific and engineering practices in STEM plans curriculum appropriate to the students, to the content, and to course objectives - 1. Asking questions (science) and defining problems (engineering), 2. Developing and using models, 3. Planning and carrying out investigations, 4. Analyzing and interpreting data, 5. Using mathematics and computational thinking, 6. Construction explanations (science) and designing solutions (engineering), 7. Engaging in argument from evidence, 8. Obtaining, evaluating, and communicating information (2.2). Demonstrate understanding through the application of the seven crosscutting concepts that should be reinforce by repeated use in instruction across the disciplinary core ideas (patterns, cause and effect, scale, proportion, and quantity, systems and models, energy and matter, conservation, structure and function, stability and change)(2.3). Demonstrate understanding of the disciplinary cored ideas in physical sciences, life sciences, and earth and space sciences in the Framework for K-12 Science Education by identifying and implementing lessons, units that integrate science and engineering practices with these core ideas(2.4, 2.5, 2.6, 2.8). Demonstrate a command of the Common Core State Standards for math and English/language arts and ISTE Technology Standards for Teachers and Students(2.7). Demonstrate a command of diverse teaching strategies for reading and writing information texts (2.9).

3. **Fundamental understanding of the principles of life sciences**

   The teacher demonstrates a deep understanding following active investigations in the principles of life sciences. Core Idea LS1 - From Molecules to Organisms: Structures and Processes, Core Idea LS2 - Ecosystems: Interactions, Energy, Dynamics, Core Idea LS3 - Heredity: Inheritance and Variation of Traits, Core Idea LS4 - Biological Evolution: Unity and Diversity (3.1)

4. **Fundamental understanding of the principles of physical sciences**

   The teacher demonstrates a deep understanding following active investigations in the principles of physical sciences. Core Idea PS1 - Matter and Its Interactions, Core Idea PS2 - Motional and Stability: Forces and Interactions, Core Idea PS3 - Energy, Core Idea PS3 - Energy in Chemical Processes and Everyday Life, Core Idea PS4 - Waves and Their Applications in Technologies for Information Transfer (4.1)

5. **Fundamental understanding of the principles of earth and space sciences**

   The teacher demonstrates a deep understanding following active investigations in the principles of earth and space sciences. Core Idea ESS1 - Earth's Place in the Universe, Core Idea ESS2 - Earth's Systems, Core Idea ESS 3 - Earth and Human Activity (5.1)

6. **Fundamental understanding of the principles of engineering design, technology, and applications of science:**

   The teacher demonstrates a deep understanding following active investigations in the principles of engineering design cycle in the context of K-6 science. Core Idea ETS1 - Engineering Design, Core Idea - ETS2 - Links Among Engineering, Technology, Science and Society.

Course Objectives

Students will be able to…	Evidence of Student Learning:
Distinguish the difference between hands-on activities, guided inquiry, Student-driven inquiry, and other methods of content presentations. 1.1, 1.2, 1.3, 1.4, 1.9, 2.2, 2.3, 2.5, 2.6, 2.7, 2.8,	● participation in demonstrations of model lessons selected from exemplary sources ● participation in science classroom lab activities selected from research-based sources
Utilize exemplary sources of inquiry-based science and engineering lessons. 1.1, 1.2, 1.5, 1.6, 1.7, 1.8, 1.10, 2.4, 2.5, 2.6, 2.7, 3.1, 4.1, 5.1, .6.1	● sources cited in each lesson plan that provides background information on the concepts presented, including relevant district, state, or national standards ● content accuracy throughout each lesson plan
Write performance objectives aligned with national and state standards and assessments of those objectives for each lesson. 1.1, 1.2, 1.7, 1.9, 2.2, 2.3, 2.4, 2.6, 3.1, 4.1, 5.1, 6.1	● performance objectives and corresponding assessments included in each lesson plan ● standards cited in each lesson plan
Design and teach inquiry-based lessons using the 5E Instructional Model. 1.1, 1.2, 2.2, 2.3, 2.4, 2.5, 2.5, 2.7, 2.9, 3.1, 4.1, 5.1, 6.1	● three inquiry-based lesson plans for each grade level in this course ● written feedback on draft lesson plans by peers prior to submission to instructor ● written feedback by the instructor
Demonstrate awareness of personality and learning differences and discuss the implications for teaching and learning. 1.8, 1.10, 2.2, 2.3, 2.9	● completion and analysis of personal learning difference or personality survey instrument ● participation in class discussions on the implications of personality and learning differences for teaching and learning
Use probing questions to elicit feedback to determine students' acquisition of knowledge. 1.8, 1.10, 2.2, 2.3, 2.9	● participation in class discussions on questioning strategies ● extensive examples of possible questions and expected responses listed in each lesson plan ● evidenced in student-generated exam
Discuss strategies for achieving instructional equity. 1.8, 1.10, 2.2, 2.3, 2.9	● discussion of strategies for achieving instructional equity ● participation in class activities modeling strategies for achieving instructional equity ● development of semester plan shows content logically transitioning from strand to strand
Demonstrate proficiency in the use of technology for professional productivity purposes. 1.2, 1.8, 1.10, 2.7, 2.9	● consistent use of various productivity applications and technologies such as email, web-based courseware, Internet, word-processing and presentation applications, etc.
Plan for and implement safe classroom practices. 1.1, 2.5, 2.8	● classroom management strategies modeled ● safety issues addressed in each lesson plan ● Science Safety Checklist

Methods/Instructional Strategies

Demonstration lessons led by instructors, as well as science lessons adapted by students, are carefully selected to serve a number of purposes. Students should not only best instructional practices, but also address national, state, or local science or math standards. Additionally, consideration should be given to the lesson source. Seek out lessons that are research-based, endorsed by leading science and/or mathematics organizations, and that are "tried and true"- they have been taught repeatedly, by a number of instructors, and with a variety of students

IV. **Required Texts** (textbook is required for this class)

- Elementary Science Methods A constructivist approach, 6th Edition Author: Martin, David Jerner,
! ISBN-10: 1111305439 | ISBN-13: 978-1111305437

V. Assignments, Evaluation Procedures and Grading Policy

Candidates in School Personnel Preparation programs, including certificate programs, are expected to purchase a chalk and wire account and to load major assignments into chalk and wire as directed by the course instructors. Please note that failure to upload assignments into chalk and wire and/or lack of assessment of the assignments may result in an "I" in the course and will preclude successful completion of the program of study.

ePortfolio – Create a free account at www.livebinders.com. Create a cover page for the LiveBinder. All of your assignments will be posted in this ePortfolio. Your instructor has created a Course LiveBinder for you to copy and use throughout the course (http://bit.ly/16hB2Q9). Create the following tabs for organizing course requirements: the levels of your certification, Hands-on activity, *Literature and Science*
1: Matter, *Literature and Science 2*: Organisms, *Literature and Science 3*: Earth, *Literature and Science 4*: Space, Science Safety Checklist, Weekly Reflections, Teach Experience #1, Teach Experience #2, Student Interview, Live Animals in the Elementary Classroom, Professional Development, Technology. When you have added an assignment to your LiveBinder, please email your instructor that the assignment is ready for grading.

1. 5**E Lessons Plans -** You will write three 5E lesson plans for each grade level: PK/K, 1, 2, 3, & 4. A template for the lesson plan requirements will be provided. Each set of lesson plans are to be submitted before the last class of each month. You are required to notify your instruct via email when you have submitted each set of lesson plans.
2. **Science Safety Checklist -** Research lab safety issues in the elementary school, and then use a lab safety survey to assess safety issues in their internship classroom. This must be completed before the Inquiry Science Lesson is taught in the classroom. You are required to notify your instruct via email when you have submitted this assignment.
3. **Reflections and Literature & Science Activities (a) –** Weekly LiveBinder Entries – Create a tab for your Weekly Reflections Assignment that will encompass reflections about one lab activity each week. Include the following for each reflection:

    A. Provide the application of inquiry learning that occurred in the activity, B. Provide a real-world relevance to the activity,
    C. Name and describe at least two ways you could assess the science knowledge your "students" obtained from the investigation, and
    D. Provide a specific example of how you can connection interdisciplinary literacy to the lab, and explain how the relates to the activity.
    E. Provide a brief summary of the activity on which you are reflecting, You can write these in a list or in a paragraph - your choice.

a. **Science & Children's Literature –** Using the prescribed templates, create a series of resources that revolve around a children's literature book: websites, lesson plans, etc. that demonstrate your ability to connect children's literature to one Big Idea in science. *Literature and Science 1*: Matter, *Literature and Science 2*: Organisms, *Literature and Science 3*: Earth, *Literature and Science 4*: Space. Add each as a tab in your LiveBinder www.livebinders.com. Give appropriate documentation when necessary. You are required to notify your instruct via email when you have posted this assignment.

4. **Hands-on Activity -** This assignment requires you to choose, plan, practice and present a hands-on activity demonstration appropriate for use in grades K-3. The demonstration should last 5-10 minutes and will be presented to your peers. You may choose to also present this demonstration in your field experience for more practice teaching. Create a Google Doc and invite your instructor to review the document. Your written materials should include: (1) Name of your activity demonstration (2) Purpose and target concept(s). Include a paragraph or two explaining the underlying science concepts involved. Include diagrams. (3) Materials needed (4) Procedure. For ease of using this, a bulleted list is better than paragraph form. Include
diagrams or pictures if needed. (5) Questions you will ask. Questions you will ask. These may be sprinkled throughout your procedure, but they should be easy to pull out visually from the text. Include answers. (6) Reference Sources. Make sure to include sources for explanation of background information in addition to the source of the idea. Include titles, not just addresses. Include annotations. After your presentation, add your lesson plan as a tab in your LiveBinder www.livebinders.com. Give appropriate documentation when necessary. You are required to notify your instruct via email when you have posted this assignment.

5. **Teach Experience –** Choose a content area in consultation with your field placement mentor teacher. Design a science lesson in the 5E Lesson (see rubric) to teach in your field placement. Research and prepare a document delineating important concepts related to that content. For example, static electricity to second grade conceptions: "how charges work" and how charged objects "stick" to uncharged objects. Rubric provided in class and on BlackBoard. Add your lesson plan as a tab in your LiveBinder www.livebinders.com. You are required to notify your instruct via email when you have posted this assignment.

6. **Cooperating Teacher Interview** – After your Teach Experience, interview your cooperating teacher (from Assignment #5) that elicits ideas about classroom management (management of instruction groups, transitions, materials and supplies and non-instructional duties), directions, and explanations of content during the lesson. Write a reflection paper that describes your interview and the rubric your CT used during your teaching. Add your lesson plan as a tab in your LiveBinder www.livebinders.com. You are required to notify your instructor via email when you have posted this assignment.

7. **Technology -** (A) Use the Teacher Tech Competencies (ISTE NETS-T) to answer the question on this assignment. (B) Professional development online: Following the instructions on the course LiveBinder for this assignment. You are required to notify your instruct via email when you have posted this assignment.

8. **Science Field Trips for the Elementary Classroom** - Create a mock field trip experience for one of these places. Include science standards, objectives and activities to be done at the site. (Donald W. Reynolds Science Center/Museum of Discovery, Pinnacle Mountain State Park, Little Rock Zoo, Gator Park Fun Center, Riddle's Elephant and Wildlife Sanctuary, Toltec Mounds Archeological State Park, Alligator Farm and Petting Zoo, Magic Springs Theme Park, National Park Aquarium, Mid America Science Museum, Arkansas Museum of Natural Resources, Blanchard Springs Caverns). Additional sites accepted upon previous approval from instructor. Add your exam to a tab in your LiveBinder www.livebinders.com. You are required to notify your instructor via email when you have posted this assignment.

9. **Live Animals in the Elementary Classroom -** Investigate the pros and cons for hosting live animals in your elementary classroom. Write a 100-150 word paper describing the results of your research. Add as a tab in your LiveBinder www.livebinders.com. Give appropriate documentation when necessary. You are required to notify your instruct via email when you have posted this assignment.

10. **Final Exam -** The final exam is in two parts: (A) Identify the scientific processes exhibited through a series of scientific and engineering investigations. (B) Write a 5E lesson plan the demonstrates your knowledge of student-centered lesson and lab investigations taking into account factors such as safety measures, PK-4 classroom dynamics, problem solving and integrate grade-appropriate standards and practices.

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Assignment	Points
1. 5 E Lessons (2 points for each lesson; 3 lessons per grade level; 5 grade levels)	30
2. Science Safety Checklist	10
3. Weekly Reflections and Science & Literature Activities (1 point each)	10
4. Hands-on Activity	20
5. Teach Experience #1	20
6. Student Interview and Reflection	20
7. Technology Competency Questions & Reflections	20
8. Science Field Trips for the Elementary Classroom	10
9. Animals in the Elementary Classroom	10
10. Final Exam (25 points each)	50
TOTAL POINTS	200

VI. Point Grading Scale

190 — 200 = A
176 — 189 = B
159 — 175 = C
130 — 158 = D
0 - 129 = F

Grading Criteria for All Assignments:

- Followed ALL assignment guidelines
- Clarity and organization of thought
- No grammatical or spelling errors
- Turned in on time: 10% of assignment points are deducted per late day. Assignments are due at the required times listed below. Late points accrue at that point.

Note: If an assignment is turned in late, points will be reduced by 10% for each day late up to a reduction of 50%. After 5 days (50% off), work turned in can receive only a maximum of half credit.

VII. Class Policies

1. **Attendance**: Active participation along with class attendance for all class sessions is essential. Absent, tardiness and leaving class early should be excused in writing to the instructor on or before the class day with a legitimate explanation. **Request for excused absence must be submitted in writing to the course instructor.** In order for an absence to be considered "excused" you must:

- Contact the instructor on or before the class day with a legitimate explanation.
- Make arrangements to get any handouts that were distributed.

Note: You will be working in groups to prepare lessons. Missing class means you will miss the opportunity to work with your partner and to prepare to teach your lesson. Your students deserve your best effort. Missing class without previously contacting me, or missing class more than once (even if you let me know) will lower your grade up to one letter grade per class missed.

2. **Technology Proficiency:** You will be required to be computer literate when you teach, so we will require you to demonstrate some basic productivity skills in this course. As you progress through the program you will acquire more advanced skills and learn more about how to integrate technology into instruction. Students must be able to: use Blackboard to access the course web site; create Microsoft Word documents; attach documents to email; check email daily. THIS COURSE IS WEB-ENHANCED.

3. **Late Assignments:** Points will be reduced by 10% for each day late. (See note above.)

4. **Lesson Plans:** Each student will work individually and with a partner to write lesson plans for the middle-level/secondary science class. These lesson plan assignments will be discussed in class. Due dates are listed on the class schedule.

5. **Academic Integrity:** Academic dishonesty cannot be condoned nor tolerated in the university community. Such behavior is considered a student conduct violation and students found responsible of committing an academic offense on the campus, or in connection with an institution-related or sponsored activity, or while representing the university or academic department, will be disciplined by the university.

The most common offenses subject to grade penalty and/or disciplinary action are:

- Cheating on an examination or quiz: To give or receive, to offer or solicit information on any quiz or examination including (a) copying from another student's paper; (b) using prepared materials, notes, or texts other than those specifically permitted by the professor during an examination; (c) collaborating with another student during an examination; (d) buying, selling, stealing, soliciting, or transmitting an examination, or any material purported to be the unreleased content of an upcoming examination, or the use of such material; (e) substituting for another person during an examination or allowing such substitution for oneself; (1) bribing a person to obtain examination information.

- Plagiarism: To adopt and reproduce as one's own, to appropriate for one's own use and incorporate in one's own work without acknowledgment, the ideas of others or passages from their writings and works.
- Collusion: To obtain from another party, without specific approval in advance by the professor, assistance in the production of work offered for credit to the extent that the work reflects the ideas or skills of the party consulted rather that those of the person in whose name the work is submitted.
- Duplicity: To offer for credit identical or substantially unchanged work in two or more courses,
without specific advance approval of the professors involved.

Disability Support Statement:
Your success in this class is important to me, and it is the policy and practice of the University of Arkansas at Little Rock to create inclusive learning environments consistent with federal and state law. If you have a documented disability (or need to have a disability documented), and need an accommodation, please contact me privately as soon as possible, so that we can discuss with the Disability Resource Center (DRC) how to meet your specific needs and the requirements of the course. The DRC offers resources and coordinates reasonable accommodations for students with disabilities. Reasonable accommodations are established through an interactive process among you, your instructor(s) and the DRC. Thus, if you have a disability, please contact me and/or the DRC, at 501-569-3143 (V/TTY) or 501-683-7629 (VP). For more information, please visit the DRC website at www.ualr.edu/disability

Resources:
Handouts from the instructor, web-sites, bibliographies, and other supplemental resources will be
provided to the student at the appropriate time during the course.

Elementary science concepts:

Physical Sciences

Core Idea PS1: Matter and Its Interactions
- PS1.A: Structure and Properties of Matter
- PS1.B: Chemical Reactions
- PS1.C: Nuclear Processes

Core Idea PS2: Motion and Stability: Forces and Interactions
- PS2.A: Forces and Motion
- PS2.B: Types of Interactions
- PS2.C: Stability and Instability in Physical Systems

Core Idea PS3: Energy
- PS3.A: Definitions of Energy
- PS3.B: Conservation of Energy and Energy Transfer
- PS3.C: Relationship Between Energy and Forces
- PS3.D: Energy in Chemical Processes and Everyday Life

Core Idea PS4: Waves and Their Applications in Technologies for Information Transfer
- PS4.A: Wave Properties
- PS4.B: Electromagnetic Radiation
- PS4.C: Information Technologies and Instrumentation

Life Sciences

Core Idea LS1: From Molecules to Organisms: Structures and Processes
- LS1.A: Structure and Function
- LS1.B: Growth and Development of Organisms
- LS1.C: Organization for Matter and Energy Flow in Organisms
- LS1.D: Information Processing

Core Idea LS2: Ecosystems: Interactions, Energy, and Dynamics
- LS2.A: Interdependent Relationships in Ecosystems
- LS2.B: Cycles of Matter and Energy Transfer in Ecosystems
- LS2.C: Ecosystem Dynamics, Functioning, and Resilience
- LS2.D: Social Interactions and Group Behavior

Core Idea LS3: Heredity: Inheritance and Variation of Traits
- LS3.A: Inheritance of Traits
- LS3.B: Variation of Traits

Core Idea LS4: Biological Evolution: Unity and Diversity
- LS4.A: Evidence of Common Ancestry and Diversity LS4.B: Natural Selection
- LS4.C: Adaptation
- LS4.D: Biodiversity and Humans

Earth and Space Sciences

Core Idea ESS1: Earth's Place in the Universe
- ESS1.A: The Universe and Its Stars
- ESS1.B: Earth and the Solar System
- ESS1.C: The History of Planet Earth

Core Idea ESS2: Earth's Systems
- ESS2.A: Earth Materials and Systems
- ESS2.B: Plate Tectonics and Large-Scale System Interactions
- ESS2.C: The Roles of Water in Earth's Surface Processes
- ESS2.D: Weather and Climate
- ESS2.E: Biogeology

Core Idea ESS3: Earth and Human Activity
- ESS3.A: Natural Resources
- ESS3.B: Natural Hazards
- ESS3.C: Human Impacts on Earth Systems
- ESS3.D: Global Climate Change

Engineering, Technology, and the Applications of Science

Core Idea ETS1: Engineering Design
- ETS1.A: Defining and Delimiting an Engineering Problem
- ETS1.B: Developing Possible Solutions
- ETS1.C: Optimizing the Design Solution

Core Idea ETS2: Links Among Engineering, Technology, Science, and Society
- ETS2.A: Interdependence of Science, Engineering, and Technology
- ETS2.B: Influence of Engineering, Technology, and Science on Society and the Natural World

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Your 5E lesson plans may focus on any science concept. The 5E lesson plan must include a hands-on, inquiry component. An important step in the 5E lesson process will be reflection on teaching. The lesson plan is an individual project.

Lesson Plan Checklist:

- NGSS
- Disciplinary Core Idea
- Student Objective(s)
- 5E's (Engage, Explore, Explain, Elaborate, Evaluate)
- Supplies and Technology Needed
- Essential Vocabulary
- Safety Considerations
- Curricular Integration
- Additional Differentiated Instruction
- Process Skills Used in the Lesson
- Sources

5-E Lesson Plant Templates (bit.ly/W6ooAD), (bit.ly/W6ooAD)

- Project-Based Learning Sites:
  - Intel PBL examples (bit.ly/IHURq)
  - Exploring the Environment PBL (bit.ly/9d5bgE)
  - PBL Checklist (http://pblchecklist.4teachers.org/checklist.shtml)
  - Center for Innovation and Engineering in Science Education (http://www.ciese.org/collabprojs.html)
- Collaborative Sites:
  - Web2.0 Online Search Engine (http://www.go2web20.net/)
  - VoiceThread (http://ed.voicethread.com/)
  - Wall Wisher (http://www.wallwisher.com/)
  - Lure of the Labyrinth (bit.ly/Zr6FV6)
  - ThinkQuest (http://www.thinkquest.org/en/)
  - LiveBinders UALRTeach technology binder (bit.ly/U0EMQS)
- Designing Instruction and Probing Student Understanding:
  - Performance Assessment Links in Science (http://pals.sri.com/standards/nses5-8.html)
  - Formative Assessment Strategies (bit.ly/12dLpC9)
  - NCREL's Building on Prior Knowledge and Meaningful Student Contexts/Cultures (bit.ly/CiPWt) NCREL's Working Toward Student Self-Direction and Personal Efficacy as Educational Goals (bit.ly/ JJOPo4)
  - How to Implement Standards, Curriculum, and Assessment (bit.ly/12q31d7) Hot to Develop as a Professional (bit.ly/12dM5HR)
  - National Board Professional Teacher Standards 5 Core Propositions (bit.ly/ddRd1c)
- Teaching with the Brain in Mind
  - BrainBreaks Blog (http://brainbreaks.blogspot.com/)
  - Funderstanding article (http://www.funderstanding.com/educators/brain-based-learning/) Brain-Based Learning by Eric Jensen (http://www.jensenlearning.com/what-is-brain-based- research.php)
  - Whole Brain Teaching by Chris Biffle (http://www.wholebrainteaching.com)
  - 1!0 Brain-Based Learning Laws (bit.ly/vZm5Yf)

VIII.References:

Jensen, Eric. (2005). *Teaching with the Brain in Mind.* Alexandria, VA: ASCD.

Kauchak, D. & Eggen, P. (2008). Introduction to teaching - Becoming a Professional: Third Edition. Upper Saddle River, NJ: Pearson, Merrill Prentice Hall.

Kellough, R. D., & Carjuzaa, J. (2009). *Teaching in the middle and secondary Schools* (9th ed.). Boston: Pearson.

Martin-Hansen, Lisa. "Defining Inquiry." The Science Teacher (Feb. 2002): 34-37.

Moore. K. D., (2012). *Effective strategies for teaching,* Sage Publications Inc. Thousand Oaks, CA.

READ! READ! READ! The syllabus is a flexible document; print a hard copy to refer to throughout the course as assignments and due dates change due to the progression of the content in the course. Check your e-mail and Blackboard regularly. Enjoy the course.

ECED 3304: ELEMENTARY SCIENCE METHODS, Grades K-4

I HAVE RECEIVED AND READ THE SYLLABUS FOR ECED 3304, Grades K-4.

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Print Name

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Signature Date