



# MISSISSIPPI STATE UNIVERSITY™

## COLLEGE OF EDUCATION

Department of Curriculum, Instruction, and Special Education Course Syllabus

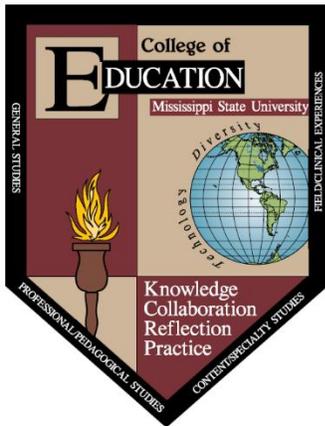
### EDE 4113 Teaching Elementary and Middle Level Science

**Credit Hours:** Three (3) Semester Hours

**Method of Instruction:** B = Lecture/Lab

**Catalog Description:** Two hours lecture. Two hours laboratory. (Pre-Requisites: All Professional Education courses, except EDE 3443; 12 Hours of MA courses; Co-Requisites: EDE 4123, EDE 4143, & RDG 4133) Field based. The selection, organization, and presentation of natural science content for elementary and middle school students, assessment of learning, and general effectiveness of instruction.

#### College of Education Conceptual Framework



The faculty in the College of Education at Mississippi State University are committed to assuring the success of students and graduates by providing learning opportunities that are continually improved as society, schools, and technology change. The organizing theme for the conceptual framework for the College of Education at Mississippi State University is educational professionals - dedicated to continual improvement of all students' educational experiences. The beliefs that guide program development center on the tenets of knowledge, collaboration, reflection, and practice. For additional information, please visit <https://www.educ.msstate.edu/about/framework/>.

#### Course Objectives

Upon completion of the course, the student will be able to:

1. Apply the principles of constructivism to the teaching and learning of elementary science concepts. [INTASC 2, 3; CAEP 2.C; CFPO 2; CRT 4.1, 4.2]
2. Identify the science content and process skills that are taught throughout the elementary/middle school grades. [INTASC 1; CAEP 2.C; CFPO 3; CRT 4.1, 4.2]
3. Explain children's and adolescent's ideas concerning science and how those ideas influence learning. [INTASC 2; CAEP 1.A; CFPO 2, 3]
4. Respond appropriately in various ways to the needs of diverse learners in science. [INTASC 3; CAEP 1.A; CAEP 1.B, 3.D; CFPO 2, 8; CRT 1.1]
5. Implement pre-planned science lessons using an inquiry-based approach. [INTASC 4, 5, 7; CAEP 5.A, CAEP 5.B; CFPO 5, 7; CRT 4.1, 4.2]

6. Enhance the science learning of students in grades K-8 through effective classroom organization and management techniques. [INTASC 5; CAEP 3.E; CFPO 6]
7. Identify appropriate assessment tools that are aligned with science learning objectives and activities to effectively assess student understanding and achievement in science. [INTASC 8; CAEP 3.A, 3.B; CFPO 4; CRT 13.1]
8. Identify a variety of resources for teaching science. [INTASC 1, 10; CAEP 3.C, 4.A; CFPO 9]
9. Plan science lessons that integrate other subjects and technology with science concepts and skills. [INTASC 6, 7; CAEP 2.C; CFPO 5, 10]
10. Reflect meaningfully and purposefully on teaching science in order to increase student understanding in science. [INTASC 10; CAEP 5.B; CFPO 1]

### **Detailed Course Outline/Topics Covered in the Course**

1. Learning Theories and How They Inform Science Teaching – 4.5 hours
  - Understanding the importance of scientific literacy (2 hrs.)
  - Understanding the principles of constructivism (1 hr.)
  - Learning theories and their application to science teaching (1 hr.)
  - Multiple Intelligences and their application to science teaching (30 mins.)
2. Effective Strategies for Conceptual Change in Science – 1.5 hours
  - Utilizing discrepant events
  - Identifying alternative conceptions
  - Assimilating and accommodating new learning
3. Science as Inquiry and Science as Conceptual Learning – 9 hours
  - Identifying and teaching science inquiry process skills (3 hrs.)
  - Teaching science concepts through guided discovery (6 hrs.)
    - a. Understanding force and motion discovery activity (1.5 hrs.)
    - b. Exploring static electricity discovery activity (1.5 hrs.)
    - c. Identifying kinetic and potential energy discovery activity (1.5 hrs.)
    - d. Differentiating between Newtonian and non-Newtonian fluids discovery activity (1.5 hrs.)
4. Planning for science teaching – 9 hours
  - Planning an inquiry-based science lesson (utilizing the 5Es) (7 hrs.)
    - a. Identifying and planning instructional practices for inquiry-based science lessons (2 hrs.)
    - b. Understanding and implementing Engagement practices (1 hr.)
    - c. Conducting Exploration (experiments) using 5Es format (1 hr.)
    - d. Integrating literacy strategies in the Explanation process (1 hr.)
    - e. Implementing activities that Elaborates on the experimental process (1 hr.)
    - f. Developing and administering effective Evaluation tools/assessments (1 hr.)
  - Planning a lesson to alter an alternative conception (1 hr.)
  - Identifying the scope of the science curriculum (1 hr.)
    - a. Determining an appropriate sequence for the science curriculum through unit planning
    - b. Integrating science with other subjects
    - c. Organizing and managing the science classroom
    - d. Becoming a reflective practitioner
5. Assessing science learning –2 hours
  - Identifying various formative and summative assessments
  - Creating authentic assessment to match student learning
6. Using technology to teach science –2 hours
  - Understanding the importance of fostering technological literacy

- Identifying various technological resources (such as software, the internet, etc.) that can be used to enhance science learning
  - Integrating technology into the science curriculum
7. Meeting the needs of all students in science – 2 hours
- Children from diverse cultural backgrounds
  - Children with special needs
  - Challenging the intellectually advanced students
  - Achieving gender equity in the science classroom

### **Text(s)/Course Materials**

Abruscato, J. & DeRosa, D.A. (2018). *Teaching children science: A discovery approach (9<sup>th</sup> ed.)*. Boston: Pearson.

Mississippi Department of Education (2018). *2018 Mississippi college and career readiness standards for science*. Retrieved from

[https://www.mdek12.org/sites/default/files/documents/Secondary%20Ed/2018-ms\\_ccrs---sci\\_k-12\\_final\\_20171006.pdf](https://www.mdek12.org/sites/default/files/documents/Secondary%20Ed/2018-ms_ccrs---sci_k-12_final_20171006.pdf)

### **Description of Instruction**

B = Lecture/Lab. A variety of methods of instruction will be employed. This class is designed to prepare candidates to teach science in the K-8 classroom; therefore, the instructor will model teaching techniques appropriate for the elementary science classroom. Specific instructional methods will include interactive lecture, demonstration lessons, class discussion, computer laboratory work, and candidate presentations.

### **Mississippi State University Honor Code**

“As a Mississippi State University student, I will conduct myself with honor and integrity at all times. I will not lie, cheat, or steal, nor will I accept the actions of those who do.”

*Upon accepting admission to Mississippi State University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning, and to follow the philosophy and rules of the Honor Code. Students will be required to state their commitment on examinations, research papers, and other academic work. Academic dishonesty will not be tolerated and will be dealt with according to MSU policy. Ignorance of the rules does not exclude any member of the MSU community from the requirements or the processes of the Honor Code.*

For additional information visit: <http://students.msstate.edu/honorcode>.

### **Technology**

#### **Computer/Technology Requirements & Required Downloads**

- Technology will be used in EDE 4113 through TaskStream (a course website), various science educational websites and virtual manipulatives, and Microsoft productivity software (Word, Power Point, etc.). Candidates are expected to have necessary technology skills to efficiently and effectively use these technological resources.
- Candidates must have on-going access to a computer with high speed internet access via DSL or equivalent broadband connectivity option (traditional dial-up Internet services do not provide adequate support to the technologies used within the course).
- Candidates must have an active *Watermark* account. This course requires a subscription to *Taskstream*, which is an online portfolio that is used for course assignments and assessment

purposes. Assignments required in *Taskstream* must be submitted for successful completion of the course. To obtain a subscription, go to [www.taskstream.com](http://www.taskstream.com) Then you will need to self-enroll in two folios: “Fall 2019 Senior Block-Starkville” and “Fall 2019 Senior Block CAPA-Starkville”. The two program codes you will need are likely: F19-SeniorBlock-S and F19-SBCAPA-S.

### **Diversity**

Diversity, within the context of the elementary and middle school science classroom, will be addressed throughout the course. It will be discussed through various content-appropriate activities that is supported by instructional and assessment strategies that adequately meet the needs of diverse learners.

### **Accommodations for Students with Disabilities**

In accordance with section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act, Mississippi State University reasonably accommodates students who demonstrate, through appropriate documentation, a qualified disability. Students with disabilities in need of accommodations to meet the expectations of this course are encouraged to bring this need to the attention of the instructor and should register with the Office of Student Support Services as soon as possible. The Office of Student & Disability Support Services is located in 01 Montgomery Hall, (662) 325-3335 (phone), and <http://www.sss.msstate.edu> (web address).

### **Field Component**

EDE 4113 includes a field-based practicum that immediately precedes the internship semester. The purpose of the field experience is for teacher candidates to learn to recognize the stages of physical growth and cognitive development of elementary/middle school students by participating in planning, managing, and evaluating elementary/middle school students through active engagement in research-based learning experiences. Teacher candidates are assigned to one elementary/middle school classroom to carry out basic teaching responsibilities under the supervision of MSU Senior Methods Block Faculty and Classroom Mentor Teachers.

### **Required Activities for EDE 4113:**

- Completion of 18 hours of field experience in the assigned science classroom, as prescribed on the Senior Block Field Experience Calendar, to occur over the course of the eleven weeks of the field experience.
- Completion of 6 hours of “Other” elementary teacher experiences; e.g. duty, recess, PE, art, music, lunch, etc.
- Completion of a Weekly Attendance Verification Sheet submitted to your EDE 4113 instructor in hard copy, signed and dated each week by you and your Mentor Teacher, which includes at least 20 hours over the course of the semester.
- Participation in field experience activities at the assigned field experience classroom on Tuesdays and Thursdays from 8:00 to 2:30 at minimum; during this time, at least 2 hours each week must be engaged in science experiences; participation in field experience activities at the assigned field experience classroom on various Fridays (see Senior Block Field Experience Calendar).
- Completion of 5 hours of science seminars and 1 hour of general seminar for a total of 30 hours of Lab Hours for EDE 4113.
- Completion of 3 structured observations: Questioning, Content Delivery, Communication
- Implementation of 1 whole class science lesson, assuming all responsibility for the teaching of this lesson; teaching may only occur after approval of the lesson plan by the EDE 4113 instructor

- When not teaching the whole class lesson, you are to assist the science mentor teacher by working one-on-one or with small groups of students or by assessing student performance each Tuesday or Thursday over the course of the 11-week Field Experience.

## Evaluation of Student Progress

### Student Activities/Assessments

#### Science Content Assignments

#### 900 Total Points

Class Attendance & Participation	15 pts. (1 @15 per class meeting)
Discussion Boards	65 pts. total
Personal Introduction	5 pts.
Standard(s), Objective, & Experiment	20 pts.
Differentiation Activities	15 pts.
Formative Assessments	15 pts.
Article & Literacy Strategy	10 pts.
5 Day Unit Content Health Lesson Plan	100 pts.
Science Content Health Lesson Plan	100 pts.
Science Museum Lesson Plan	100 pts.
5 Day Unit Science Museum Lesson Plan	100 pts.
Science Museum Lesson Plan Planning Guide	20 pts
Webquest Assignment	100 pts.
Scientific Observations Integration Assignment	100 pts.
Content Health Lesson Plan Reflection	20 pts.
Weekly Quizzes	60 pts. (6 @10 pts. each)
Science Content Test	20 pts.
Final Exam	100 pts.

#### Science Field Experience

#### 100 pts. total

3 Science Structured Observations (4 pts. each)	12 pts
Dispositions	7 pts.
2 Science DARs	8 pts
Science TIAI	36 pts ( <i>Mentor Teacher</i> )
Professionalism & Disposition	15 pts.
Time Sheet, & Weekly Attendance	22 pts.

#### Total Points

#### 1000 points

#### Evaluation of Science Field Experience

100 points (*Determined by assigned University Supervisor*)

3 Science Structured Observations (4 pts. each)	12 pts
Dispositions	7 pts.
2 Science DARs	8 pts
Science TIAI	36 pts ( <i>Mentor Teacher</i> )
Professionalism & Disposition	15 pts.
Time Sheet, & Weekly Attendance	22 pts.

### Overview of Student Activities/Assessments

**Class Discussions/Class Assignments/Class Participation:** Various in-class and out-of-class assignments will be completed throughout the semester based on the assigned chapter readings and discussions. All in-class assignments will only be collected at the end of class and point will be assigned based on participation and quality. Your presence in class each day and completion of all discussions/assignments will be mandatory in order to receive class participation points. Information provided on each chapter will be briefly discussed each class meeting; however, chapter discussions will be minimal. It is your responsibility to read each chapter and the information provided on the PowerPoint slides found on

class website. Our time each day will be spent completing/discussing assignments/activities that correspond to the information contained in the chapter. (Objectives 1, 2, 3, 4, 5, 6, 7, 8, 9, 10)

**Discussion Board Activities (Weekly):** Participation in weekly Discussion Board Threads on assigned topics related to Content Health Lesson Plan completion and implementation. Participants must post initial response and respond to two peers by the deadline. (Objectives 1, 2, 3, 4, 7, 8, 9, 10)

**5 Day Content Health Unit Lesson Plan:** You will compose a 5-Day Content Health Unit Lesson Plan that focuses on a Body System for your assigned lower placement grade. The unit plan will serve as the basis for your 2-Day Content Health Lesson Plan that will be implemented in your lower placement classroom. (Objectives 1, 2, 4, 5, 6, 7, 8, 9)

**Content Lesson Plan/Content Health Lesson Plan Reflection (last day of class):** The lesson plan will be written using the 5E Taskstream Basic Science lesson plan format and taught over 2 days: Day 1: Engagement and Exploration and Day 2: Explanation, Elaboration (*Because of time constraints, you will not teach the Elaboration in your field placement*), & Evaluation. This lesson will teach content material using an innovative and creative method that incorporates inquiry learning. Teacher candidates will use the 2018 Career and College Readiness Standards for Science and the 2016 Career and College Readiness Standards for ELA in creating this lesson. This lesson will be taught in the Teacher Candidate's assigned classroom at the elementary science (math) placement. Literature integration must be evident in the lesson plan. Expository text including an Internet article must be used in Part B of the Explanation. The Engagement will include a teacher demonstration to create curiosity about the science topic and a question/answer session to activate prior knowledge. The Overall Question will be provided in this section. The Exploration step MUST include a true science experiment (overall question, hypothesis, experiment to test the hypothesis, Science Recording sheet). Additional directions for the Explanation, Elaboration and Evaluation are located in the Science Content Health Folder in Canvas. The topic should be selected in collaboration with the assigned mentor teacher. Once this lesson is implemented, you must submit a reflection of that teaching on TaskStream. The reflection prompts can be found on TaskStream. When the reflection is submitted on TaskStream, the revised lesson plan and all components of this assignment should also be uploaded to TaskStream. This is your professional portfolio artifact for this course. Implementation cannot occur until your instructor has approved of your lesson plan. Specific expectations and requirements of this assignment, along with the rubric that will be used to evaluate this assignment will be provided to you during Science Seminar 1. (Objectives 1, 2, 4, 5, 6, 7, 8, 9, 10)

**5 Day Unit Science Museum Lesson Plan.** You will compose a 5-Day Unit Science Museum Lesson Plan on a skill of your choice from the Physical or Earth Science Strand. The unit plan will serve as the basis for the Science Museum Lesson Plan that will be create and submitted later in the semester. (Objectives 1, 2, 4, 5, 6, 7, 8, 9)

**Science Museum Lesson Plan Planning Guide:** You will use this planning guide as a tool for planning your Science Museum Lesson Plan. The guide should provide an overview of the activities and material that will be used in your lesson. (Objectives 1, 4, 5, 6, 7, 8, 9)

**Science Museum Lesson Plan:** Teacher candidates will create an Interactive Exhibit focused on a science concept for your assigned elementary science (math) placement. The teacher candidate will select a Physical, Earth, or Space lesson from Chapters 10–18 of the science textbook and write a Science Museum Lesson using the 5Es Lesson Plan Format. A Formative Assessment using an Interactive Tri-fold board must accompany the lesson plan. Teacher candidates will use 2018 Career and College Readiness Standards for Science and the 2016 Career and College Readiness Standards for ELA when creating this lesson. (Objectives 1, 2, 4, 5, 6, 7, 8, 9)

**Technology Integration (Webquest) Assignment:** In this assignment, you will select a topic based on state or national standards for your assigned elementary science (math) placement. Based on that topic, you will design a WebQuest based on the 5Es Inquiry Process that allows students to use technology to conduct explorations. For engagement, set the context of the WebQuest, interest the

student, provide background information for the student, and identify the challenge. For exploration, provide the students are given directions and exact websites to use when completing the exploration. This is when the student becomes involved with new information. For explanation, the student explains the response to the challenge or inquiry given in the Exploration. For elaboration, the student will apply the new knowledge he/she has gained. For evaluation, describe a method to assess student success. Evaluate the student to determine if the criteria for the WebQuest has been met. (Objectives 1, 2, 8, 9)

**Integration of ELA through Poetry Activity:** In this assignment, you will locate an expository science article that aligns with a science and ELA standard for your assigned grade level in the elementary science (math) placement. Read the article and summarize the information in a paragraph. Create a poem using at least 3 facts related to the topic from information found in the article. Include at least three observations related to the senses in the poem. Illustration must depict the facts and observations from the article. (Objectives 1, 2, 8, 9)

**Quizzes (Weekly):** There are 9 quizzes completed in EDE 4113. These quizzes assess your knowledge and understanding of the chapter readings. Each quiz is worth 10 points and will be completed in Canvas. Quizzes will open at 8:00 a.m. on Sunday and close at 8:00 a.m. on Wednesday. (Objectives 1, 2, 3, 4, 7, 8, 10)

**Science Content Test.** Candidates must display knowledge and understanding of science concepts that are taught within the elementary and middle level classrooms. Knowledge acquisition of those concepts will be assessed through an assessment on basic science concepts. (Objective 2)

**Final Exam:** The cumulative final exam will assess your understanding of appropriate grades K-6 science pedagogy as defined by chapter readings, power points, class discussions, and class activities discussed and experienced throughout the semester. (Objectives 1, 2, 3, 4, 7, 8, 10)

**Participation in Science Seminars:** You must attend and participate in five hours of science seminars. During seminars, discussions and activities will be completed that relate to field experiences and related science pedagogical content knowledge. (Objectives 1, 2, 3, 4, 6, 7, 8, 9, 10)

### **Grading Scale**

EDE 4113 uses a grading scale of 1000 points. The points needed for each letter grade are detailed below.

1000 – 900 = A

899 – 800 = B

799 – 700 = C

699 – 600 = D

599 & below = F

### **Attendance Policy**

Per AOP 12.09 – Classroom Attendance and Reporting Absences, you are required to attend all EDE 4113 class meetings and field experience days, including all science seminars. You are granted one absence for an emergency situation (personal illnesses and other related situations) in EDE 4113 without providing documentation. In the case of illness or a death in the family on a field experience day, you must contact the mentor teacher, the MSU block supervisor, and field experience partner as early as possible, but no later than 7:30 a.m. on the day of the absence. For each subsequent emergency absence, you must submit appropriate authoritative documentation to the instructor upon your return to campus for approval for an excused absence. Each non-emergency absence will result in a 25-point deduction from your overall point total for EDE 4113. In order for an absence to be considered excused, proper documentation must be submitted to the instructor within upon your return to campus. If you who are absent from EDE 4113 for an extended period of time, your circumstances will be considered on an individual basis after returning to class and you will be required to meet with Elementary Education faculty to discuss your future in EDE 4113 for the current semester. Additionally, you should be punctual

to class and field experiences. If you are tardy to class, a 10-point deduction from your overall point total will result. A tardy occurs when you arrive to class up to 30 minutes late. Beyond 30 minutes, constitutes an absence. You should contact the instructor in advance (prior to the start of class that day) if a test will be missed. A make-up test will only be approved in documented emergency situations or under extreme circumstances. If you are absent from a “general” seminar, a 15-point deduction from your overall point total will result in each of the four senior block courses. Any field experience or seminar hours missed must be made up, regardless of the reason for the absence.

### **Title IX Policy**

MSU is committed to complying with Title IX, a federal policy that prohibits discrimination, including violence and harassment, based on sex. This means that MSU’s educational programs and activities must be free from sex discrimination, sexual harassment, and other forms of sexual misconduct. If you or someone you know has experienced sex discrimination, sexual violence and/or harassment by any member of the University community, you are encouraged to report the conduct to MSU's Director of Title IX IEEO Programs at 325-8124 or by e-mail to [titleix@msstate.edu](mailto:titleix@msstate.edu). Additional resources are available at <http://www.msstate.edu/web/security/title9-12.pdf> or at <http://students.msstate.edu/sexualmisconduct/>.

### **Mississippi Educator Code of Ethics**

The code shall apply to all persons licensed according to the rules established by the Mississippi State Board of Education and protects the health, safety and general welfare of students and educators. Ethical conduct is any conduct which promotes the health, safety, welfare, discipline and morals of students and colleagues. Unethical conduct is any conduct that impairs the license holder’s ability to function in his/her employment position or a pattern of behavior that is detrimental to the health, safety, welfare, discipline, or morals of students and colleagues. Any educator or administrator license may be revoked or suspended for engaging in unethical conduct relating to an educator/student relationship (Standard 4). Additional information on the Mississippi Educator Code of Ethics 10 Standards is available at [https://www.mdek12.org/sites/default/files/documents/code-of-ethics\\_final.pdf](https://www.mdek12.org/sites/default/files/documents/code-of-ethics_final.pdf).

Candidates enrolled in EDE 4123 will be provided with a copy of the Mississippi Educator Code of Ethics during one of two general field experience seminars. Senior Methods Block faculty will discuss each of the 10 Standards of the code with candidates prior to the start of any field experiences. Candidates will be expected and required to adhere to the 10 Standards of the code throughout the duration of the Senior Method Block field experience.

### **Mississippi College and Career-Ready Standards**

Content standards outline the skills and knowledge expected of students from grade to grade and subject to subject. In addition to the Mississippi College and Career-Readiness Standards, the Mississippi Department of Education has developed a wide variety of training materials for educators and administrators across the state.

Candidates enrolled in EDE 4113 will develop a deeper understanding of scientific inquiry and pedagogy by engaging in content specific activities, class readings, instructional videos, and field experience activities which address the Mississippi College and Career Readiness Standards for Science. During field experiences, candidates will apply what they have learned to advance the learning of their elementary students with regards to the College and Career Readiness Standards.

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