ELED 406: Science Methods in the Elementary School
Fall 2018 Syllabus

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Instructor's Office Hours: Mon. 11:00-1 pm, Tues. 9:00-12 pm and by appt./phone	

TENTATIVE UNTIL THE FIRST DAY OF CLASS

Note: This document and other course-related materials are available at https://blackboard.wku.edu

WKU INFORMATION: (270) 745-4845

INCLIMENT WEATHER: When the WKU class is already in section and one site receives notice of closing due to bad weather, we will cancel the remaining time for class. If the WKU class has yet to begin for the day, and if only one site/section is closed, we might decide to tape the class and send the viewable link to the closed site. Please read your email for more details. On a field day, if one or more sites close field schools for the day, those WKU students are responsible for making up missed field time. The time needs to be made up within one week of the missed time.

WKU's WEATHER PLAN: If the WKU schedule is altered by inclement weather, WKU provides a number of ways you can find out if classes are delayed, canceled or if a campus is closed. Schedule changes will be announced through emergency text message, campus wide emails, on the WKU website and social media, and through a recorded phone message.

- **Text messages:** Students, faculty and staff who have signed up for WKU's emergency text messages will receive a text message announcing changes. Students, faculty and staff can sign up for text messages through TopNet by clicking on personal information and checking View / Update Cell Phone Messaging Notification.
- **Online:** Information will be posted on the WKU homepage, WKU News page, WKU Alert page, WKU Facebook page and WKU Twitter page.
- **Email:** WKU students, faculty and staff also will receive email about any schedule changes.
- **Phone:** If you can't get to a computer, the WKU Information line (270-936-0000) will have the latest information recorded.
- **News media:** In addition, WKU will notify WBKO-TV and WKYU-FM in Bowling Green and send information to other media as well.

COURSE DESCRIPTION: Instruction will include materials, methods, and resources for instruction in natural science in the elementary grades with emphasis on instructional procedures based on individual and group developmental needs. Field experience is required as part of the Professional Education Block II. Candidates must provide their own transportation to designated sites.

PREREQUISITES: The General Education natural science sequence, the ELED Block I sequence, and be enrolled in accompanying methods courses in the ELED Block II sequence. In addition, the candidate must be admitted to Teacher Education.

COURSE RATIONALE: **"**Constructivism stands in contrast to the more deeply rooted ways of teaching that have long typified American classrooms. Traditionally, learning has been thought to be a 'mimetic' activity, a process that involves students repeating, or miming, newly presented information (Jackson 1986) in reports on quizzes and tests. Constructivist teaching practices, on the other hand, help learners to internalize and reshape, or transform new information. Transformation occurs through the creation of new understandings (Jackson 1986, Gardner 1991) that result from the emergence of new cognitive structures…Deep understanding occurs when the presence of new information prompts the emergence or enhancement of cognitive structures that enable us to rethink our prior ideas" (Brooks, J & Brooks, M, 1999, p. 15).

The primary purpose of education is to prepare children to survive in the real world. ELED 406 is designed to provide the teacher candidate with knowledge, skills, and attitudes which enable them to transmit knowledge required for scientific literacy to their students and to assist each teacher with his/her own achievement of the *Kentucky Teacher Standards for Preparation and Certification.*

LEARNING OUTCOMES:

Upon successful completion of the course, the student should:

- Select and use appropriate Next Generation Science Standards (NGSS)
- Apply theories of learning related to teaching science.
- Teach science using the 5 E method
- Write/ask/analyze HOT questions.
- Create STEM/STEAM lessons
- Demonstrate how environmental education can be integrated into science teaching.
- Include various forms of technology to enhance science teaching in the classroom.
- Demonstrate the ability to use correct grammar, spelling, and punctuation to show the appropriate professionalism needed in a career in teaching.
- Demonstrate the ability to collaborate and carry out a service learning activity.

REQUIRED TEXTBOOKS:

***I have only required two textbooks so that you have money to purchase the Project WILD ($25). This book is NOT available in the bookstore. You will be able to purchase these at a later date in the semester.**

Geisen, M. (2016). *The complete middle school study guide: Everything you need to know to ace science in one big fat notebook*. New York, NY: Workman Publishing. ISBN 978-0-7611-6095-3

Keeley, Page. (2014). *What are they thinking? Promoting elementary learning through formative assessment*. Arlington, VA: NSTA Press. **ISBN 978-1-938946-25-7 (This book can be viewed online through the WKU libraries homepage).**

*National Research Council (2012). *A Framework for K-12 science education: Practices, crosscutting concepts, and core ideas*. Washington, DC: National Academies Press. **ISBN 978-0-309-21742-2. *Note: this book can be downloaded as a PDF for free.**

***Use this website for the free PDF:** http://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts

RECOMMENDED TEXTBOOKS:
Bosak, S. (2000). *Science Is…*Ontario, Canada: Scholastic Canada LTD.

COURSE PACKET:
Includes Kentucky Framework for Teaching and Next Generation Science Standards information and how to interpret it.

REQUIRED MATERIALS:

Kentucky Framework for Teaching

http://education.ky.gov/teachers/pges/tpges/pages/kentucky-framework-for-teaching.aspx

Kentucky Academic Standards

http://education.ky.gov/curriculum/standards/kyacadstand/Pages/default.aspx

MAJOR COURSE TOPICS:

Students will learn about scientific literacy. In addition, candidates will be encouraged to consider how student diversity, authentic assessment, inquiry learning, national and state standards, application of science, and integration of the curriculum will affect their teaching.

DESCRPTION OF COURSE ASSIGNMENTS:

Assignments	Description
Welcome Blog	This allows the professor and students to get to know one another in an informal learning environment.
Syllabus Quiz	This assignment is to help students read and understand the syllabus.
Frameworks Quizzes	This assignment is meant to help students understand the background behind the creation of NGSS.
What are They Thinking Reflection	This assignment will provide awareness about science misconceptions.
Science Content Quizzes	The quizzes will help prepare students for the Principles of Learning and Teaching (K-6) elementary science content.
Science Notebook	This assignment is meant to help organize science material. This can be used with future elementary students, but it also gives the students a place to refer back to when teaching science.
Science Inquiry Lesson Plan	This assignment will teach the 5-E model often used in teaching science.
3-D Mealworm & Journal	This assignment will provide awareness of how to use live creatures to teach concepts like lifecycles and metamorphosis.
Technology/Website Reflection	This assignment will provide awareness of the importance of evaluating websites and other materials for accuracy, relevance and other features.
Revised Bloom's Survey and Questions	This assignment allows the student to practice listening for HOT questions.
One Teach, One Observe Survey and Questions	This assignment helps students to observe a peer and listen for HOT Questions.

HOT Questions Reflection	This assignments helps students reflect on their ability to ask HOT questions during a science lesson.
Biomimicry Invention & Presentation	This assignment integrates engineering ideas by having students create a human invention from an animal or plant adaptation found in nature.
Team teaching using GEMS guide	This assignment will familiarize students with GEMS guides. These guides provide in depth science with a variety of topics.
Team teaching using Project WILD	This assignment will familiarize students with Project WILD guides. These guides provide great ideas for incorporating active learning about animals in the classroom.
Attend Mammoth Cave training	The purpose of the Mammoth Cave experience is to provide students with the knowledge needed to take their future classes to Mammoth Cave or field trips in general. Students will learn the mission of National Parks in America and how this mission is carried out at Mammoth Cave. Students will also learn some features of cave ecosystems, geology, and hydrology of the local area. This experience helps students develop the comfort level needed for teaching in an out-of-class setting. Students will consider how people and the cave ecosystem interact and connections between the above and below ground connection.

ADDITIONAL REQUIREMENTS: A practicum experience is required. The practicum is completed as part of the ELED Professional Block II field experience. In addition, this course is a part of the elementary education professional block experience. Requirements within the block experience will count toward the final grade in this course.

PARTIAL BLOCK ENROLLMENT:
Any candidate participating in partial block enrollment or who audit will be expected to:

1. Be fully responsible for the requirements of the individual courses in which they are enrolled (Those who audit will not be required to participate in examinations);
2. Participate fully in all Block Point experiences;
3. Participate for the required amount of time in the field experience; and
4. Be aware of changes to daily class schedules as the schedule is subject to alteration.

PARTICIPATION AND PROFESSSIONALISM: Scoring will be based on criterion such as (a) being in your seat and ready for class to begin; (b) being **on task** throughout the class **(this means no talking while the instructor is talking);** (c) **submitting assignments when due at the start of class;** (d) **no laptops or cell phones** will be permitted in class; (e) being on time in the field and staying the entire work day; and **FULL attendance** at all required events such as Mammoth Cave, International Night, Science Day, or Math Night (service depends on your site instructor). ***A professionalism rubric is attached.*** Professionalism points will be deducted at the end of the semester for violations. ***Your grade will not be sent to the Registrar's Office without the completion of the service hours.*** A **Code of Conduct Review** can affect your professionalism. If your behavior warrants a review the consequences are as follows: Level A- up to 20% reduction in professionalism score, Level B- 50% reduction in professionalism score, Level C- 100% loss of professional points. For explanation please see the Teacher Candidate Handbook.

Final grades for ELED 406 will not be forwarded to the Office of the Registrar until all field hours are completed.

COURSE GRADING AND EVALUATION: Rubrics are provided for most assignments. The rubric should be the first page of every assignment, with your name on it. *Please see Blackboard for details. There will be no "regraded" work. Seniors should be able to work diligently and complete tasks professionally the first time the assignment is given.

NOTE: Assignments received after the due date will be assessed a 10% penalty per day. 7 week days following the due date will result in no acceptance and a zero will be assigned. When turned into my mailbox, **you MUST have an administrative assistant sign and date the work, or it will be counted as late (whenever I check my mail)**. Students who miss more than 20% of the classes will receive an F. One fifth (20%) of the final grade comes from the ELED Professional Block. **No work should be submitted by e-mail. Assignments should include all parts. This means a missing rubric or other part of the assignment will result in a reduction in points.**

Assignment Name	Point Value	Due Date
Welcome Blog	5	
Syllabus quiz	5	
Frameworks quizzes	50	
What are they thinking?	20	
8 Weekly Science Content Quizzes	80	
Lesson plan	30	
Highlighted areas of lesson plan	25	
Biomimcry invention	28	
Biomimicry presentation	10	
Revised Bloom's Questions Survey	10	
Website and Technology reflection	20	
3-D Mealworm	5	
Mealworm Journal	5	
One teach, one observe HOT questions (of your peer)	10	
One teach, one observe HOT questions survey (of your peer)	10	
HOT questions reflection	15	
Teach Project WILD	20	
Mammoth Cave Professional Development	20 (no attendance at Mammoth Cave=0)	
Science Notebook	22	
GEMS teaching	30	
In class professionalism	20	
Professional Field	20	
Service Learning	10	
KFETS	10	
PD	20	
TOTAL	500	

GRADING SCALE:

465-500 points	A
425-464 points	B
385-424 points	C

350-384 points	D
349 or less points	F

NOTE: FINAL POINTS ARE USED TO DETERMINE FINAL GRADES. PERCENTAGES ARE NOT USED TO DETERMINE GRADES.

PLAGIARISM: To represent written work taken from another source as one's own is plagiarism. Plagiarism is a serious offense. The academic work of a student must be his/her own. One must give any author credit for source material borrowed from him/her. To lift content directly from a source without giving credit is a flagrant act. To present a borrowed passage without reference to the source after having changed a few words is also plagiarism. Students who commit plagiarism or any other act of academic dishonesty will receive a failing grade for the course and may be subject to dismissal from the program. Student work may be subject to review and checks using plagiarism detection software (Student Handbook). ***Please refer to the "I am aware" statements signed by all students at the start of the semester for more details.***

ACADEMIC DISHONESTY: Students who commit any act of academic dishonesty may receive from the instructor a failing grade in that portion of the course work in which the act is detected or a failing grade in a course without possibility of withdrawal. The faculty member may also present the case to the Office of Judicial Affairs Student Affairs for disciplinary sanctions. A student who believes a faculty member has dealt unfairly with him/her in a course involving academic dishonesty may seek relief through the Student Complaint Procedure (Student Handbook). ***Please refer to the "I am aware" statements signed by all students at the start of the semester for more details.***

CHEATING: No student shall receive or give assistance not authorized by the instructor in taking an examination or in the preparation of an essay, laboratory report, problem assignment or other project which is submitted for purposes of grade determination (Student Handbook).
Please refer to the "I am aware" statements signed by all students at the start of the semester for more details.

ATTENDANCE AND PARTICIPATION POLICY: Registration in this course obligates the student to regular and punctual in class attendance. Students are expected to attend all class meetings. **There is no such thing as an excused absence.** This class is to prepare you for student teaching and becoming a teacher professional. This means that you will need to turn in work the day an assignment is due, whether you attend class or not. When you are sick as a teacher, you must prepare lesson plans for your substitute. **Missed work where grades are taken during class will result in no points.** Leaving early or coming late will also result in a tardy. **Two tardies will count as one absence**. More than two absences reflects on your professionalism and may result in a reduced grade or being dropped from the course. *Arriving late or leaving early from the field will result in lowered Block points.* **You will NOT be able to make up quizzes. If you leave class early or come late after the quiz is given, your quiz will not count. Absences which are 20% or more will result in an automatic "F" in the course.**

STUDENT DISABILITY SERVICES: In compliance with University policy, students with disabilities who require academic and/or auxiliary accommodations for this course must contact the Student Accessibility Resource Center located in Downing Student Union, 1074. The phone number is 270.745.5004 [270.745.3030 V/TTY] or email at sarc@wku.edu. Please do not request accommodations directly from the professor or instructor without a faculty notification letter (FNL) from The Student Accessibility Resource Center.

STATEMENT OF DIVERSITY: We believe that diversity issues are of major import to student and school success. We fundamentally believe in and support the value of heterogeneous groups and the richness of benefits when students are involved with diverse populations, settings, and opinions. This course is designed on the basic assumption that learning is something we all actively engage in by choice and personal commitment. The format of this class will be a community of scholars, each with their rights and responsibilities of membership. We will not tolerate immoral, illegal, or unethical behavior or communication from one another, and we will respect one another's rights to differing opinions.

The Quality Enhancement Plan for Western Kentucky University:

QEP STUDENT LEARNING GOAL

WKU students will bring evidence and argument to life through written, oral, and visual means. Graduates will apply and adapt this learning to their professional, social, and personal lives.

QEP STUDENT LEARNING OUTCOMES
1. WKU students will demonstrate the ability to gather sound and relevant evidence to address an issue. (Evidence-Gathering)

2. WKU students will demonstrate the ability to analyze and synthesize the assembled evidence. (Sense-Making)

3. WKU students will demonstrate the ability to articulate a logical and supported argument based on this analysis. (Argumentation)

The HOT Questions reflection represents the ability for a student (through coteaching one teach, one observe) to gather evidence related to the ability of their peer's Higher Order Thinking questionings while teaching a science lesson. The student who taught will then demonstrate the ability to argue through logic and supported evidence their ability to use HOT questions while teaching science.

Course Required P-12 Classroom Observation or Clinical Experiences:

(If none, put "N/A" and delete the table below. For others, use the table below to provide the number of observation hours and check each type of experiences candidates have during those hours. Note: The table categories are those that the KY EPSB requires each program to have as outlined by **16 KAR 5:040 Section 3(3)**.)

Total Number of Hours: 70 hours	
EPSB Required Candidate Experience Types - 16 KAR 5:040 Section 3(3)	
(a) Engagement with diverse populations of students which include:	
1. Students from a minimum of two (2) different ethnic or cultural groups of which the candidate would not be considered a member;	X
2. English language learners;	X
3. Students with disabilities; and	X
4. Students from the following grade levels:	
• Elementary	X
• Middle School	
• Secondary	
(b) Observation in schools and related agencies, including:	
1. Family Resource Centers; or 2. Youth Service Centers	
(c) Student tutoring	
(d) Interaction with families of students;	X
(e) Attendance at school board and school-based council meetings;	X
(f) Participation in a school-based professional learning community; and	X
(g) Opportunities to assist teachers or other school professionals.	

Course Assignments and Experiences Related to:

- **The Kentucky Academic Standards (KAS)**

(If none, put "N/A." Otherwise, p**rovide information that addresses the following EPSB Program Review questions: How does the EPP ensure each candidate's knowledge/proficiency of the Kentucky Academic Standards (KAS)? How does the EPP measure the depth of knowledge of each candidate?)**

Course Assignment	**Measure of Depth of Knowledge/Proficiency**
Science lesson plan(s)	**The purpose of writing the 5 E lesson plan is to familiarize students with KAS science standards and how to implement these standards in the developmentally appropriate way for K-6 students. The depth of knowledge of the candidate is assessed within the lesson plan itself.**

This course reviews and extends teacher candidates' knowledge of the specific K-6 NGSS Disciplinary core ideas, cross cutting concepts, science and engineering practices they will teach.

- **The Kentucky P-12 Curriculum Framework and P-12 Assessment System to Guide Instruction**

(If none, put "N/A." Otherwise, briefly describe how candidates use the Kentucky P-12 curriculum framework and the Kentucky P-12 assessment system to guide instruction.)

Course Assignment	Measure of Depth of Knowledge/Proficiency
Science lesson plan(s)	**The lesson plan helps students use the curriculum framework in helping them to plan lessons that are appropriate for their grade levels and developmental levels. The lesson plan will use KAS which will help K-6 students be knowledgeable and prepare for standardized testing in science.**

- **Candidates Using the KAS Framework in Lesson Planning**

(If none, put "N/A." Otherwise, provide evidence, such as KTIP assessments/portfolio/other data, of candidates' use of the KAS framework in lesson plans. The EPSB suggests including lesson plan format if not using the current KTIP format.).

Course Assignment	Measure of Depth of Knowledge/Proficiency
Science lesson plan(s)	**Teacher candidates will use a modified version of the KTIP framework to help them design their lesson plan.**

- **Candidates Using Formative and Summative Assessments Related to Kentucky P-12 Curriculum Framework**

(If none, put "N/A." Otherwise, p**rovide evidence of candidate's abilities to create and use formative and summative assessments to guide instruction toward mastery of the Kentucky P-12 curriculum framework.)**

Course Assignment	Measure of Depth of Knowledge/Proficiency
Science lesson plan(s)	**Teacher candidates create appropriate formative assessments within their lesson plans to assess K-6 students based on mastery of KAS science.**

<u>Course Assignments Serving as an Education Preparation Program "Key Assessment"</u>:

(If none, put "N/A." Otherwise, please name and briefly describe the assessment in a paragraph. Then place the assessment name beside the category in the table below the assessment represents. Note that assessments 1-3 *have already been identified*, so no course needs to include them.)

N/A

Course Experiences and Assessments Addressing Learned Society (SPA) Standards:

(Please refer to your EPSB Program Review Document SPA Table to see what you and your program faculty have determined takes place in your course related to meeting SPA standards. Provide those standard numbers and description/titles below and briefly describe the course experiences and assessments that prepare candidates in this area.)

SPA Standard # and Description	Course Experiences and Assessments
ACEI Standard 2: Curriculum	2b. Teacher candidates will learn information that relates to helping K-6 students become scientifically literate.
ACEI Standard 3: Instruction	3a. Teacher candidates will integrate and apply science knowledge for their science lesson plans. 3c. Students will also develop critical thinking, problem solving, and performance skills of elementary students. 3d. Teacher candidates will create lessons that encourage active engagement in their K-6 students through science.

Block 2 Professionalism Rubric
20 points

Disposition	Descriptors	Comments

Attendance	Attends all classes. Arrives on time and stays full time	
Participation	Attentive in class. Engaged in activities. Responds appropriately to discussions.	
Class Preparation	Work is submitted on time. Work is completed professionally.	
Integrity/Ethical Behavior	Follows all university policies regarding academic honesty and truthfulness.	
Respect for rules, policies, and norms	Knows school rules and policies. Follows them consistently. Accepts responsibility for personally following them in patterns of dress, behavior, use of cell phones, preparedness, etc.	
Professional Responsibilities	Accepts responsibility for own actions. Actively seeks self-improvement.	
Emotional Control	Displays steady emotional temperament. Is receptive to viewpoints of others and their suggestions. Is accountable for emotions and behaviors.	