George Mason University
College of Education and Human Development
Elementary Education
EDCI 553 Section 001 - Science Methods for the Elementary Classroom (3 credits)
Summer 2018 (July 16—July 26)

Thompson Hall Rm. 2020, M-F, 8:15AM – 1:20 PM

Professor: Dr. Andrew Gilbert
Office Hours: By appointment; including email/Skype or Facetime if desired.
Office Location: Thompson 1404
Office Phone: (703)-993-3497
Email: agilbe14@gmu.edu

This course is only open to students in the Elementary Education program.

COURSE DESCRIPTION
A. Prerequisites/Corequisites
Admission to the Elementary Education program.

B. University Catalog Course Descriptions
Develops skills and abilities in science teaching methods, applications of technology, safety practices, and creation of integrated science curricula. Examines science teaching based on contemporary theory, practice, and standards. Prerequisite(s): Admission to elementary education licensure program.
Notes: Requires field experience in public schools.

C. Expanded Course Description
The primary goal of this course is to provide you with practical experience, theoretical background, and pedagogical skills that will allow you to be successful in your future career. To this end, there will be two main themes stressed over the duration of the course: 1) to facilitate the development of pedagogical approaches to inquiry-based teaching practice, and 2) to develop confidence and understanding for science and health content. With respect to content, the course will develop your background knowledge with the goal of successful teaching in an elementary science context, meaning that you will need to have a solid understanding of large-scale science topics beyond what is expected of elementary children. The course will also consider the intersection of science, self and society to investigate elements of health related content such as human body systems, nutrition, emotional health, as well as conceptions of gender and identity. Most children come to school with a keen interest in the world around them, but often by the end of elementary school only a small percentage of students have retained this interest in science content. This is generally attributed to the ways in which "school science" often ignores the beauty and joy that can come from engaging with science and connecting scientific understanding to the everyday experiences of children. Consequently, we will conceptualize science as a verb where we are consider our wonders, build new knowledge and discover as opposed to the memorization of 'science facts.' For this reason, we will utilize constructivist approaches to learning and those approaches should help you scaffold science content that is too

often presented as an exercise in the acquisition of vocabulary.

This course plans to provide opportunities for students to enjoy and embrace the ideas that make us wonder about the world and our role within it. In many respects, science can be intimidating to learn in the ways it is presented in schools, media and the general public. Our goal is to unpack those social constructions of science to present science in a more realistic light where scientists are presented as humans struggling to better understand the world (just like the rest of us) as opposed to omnipotent, infallible heroes that society and textbooks wish to portray. This class experience is merely a first step in your evolution toward becoming the kind of educator you wish to be. Lastly, you will be required to bring your curiosity to class for each session. Please make sure to nurture and feed it as we move through our work together.

LEARNER OUTCOMES
This course will enable students to:
A. Build pedagogical content knowledge base in science and health through inquiry-based investigation
B. Conceptualize core principles regarding the Nature of Science, ie. how wonder, creativity experimentation, and evidence frame scientific thinking
C. Develop lesson plans demonstrating inquiry-based principles in science and health education including the incorporation of technology
D. Demonstrate age-appropriate safety standards when designing hands-on classroom experiences
E. Examine science and health curricula and methods with respect to "Science for All" and standards documents at local, state, and national levels
F. Develop viable assessment tools for science and health contexts

KEY PROFESSIONAL STANDARDS ADDRESSED FOR PBA ASSESSMENTS

INTASC: Interstate Teacher Assessment and Support Consortium, Model Core Teaching Standards

#4. Content Knowledge. The teacher understands the central concepts, tools of inquiry, and structures of the discipline(s) he or she teaches and creates learning experiences that make the discipline accessible and meaningful for learners to assure mastery of the content.
#5. Application of Content. The teacher understands how to connect concepts and use differing perspectives to engage learners in critical thinking, creativity, and collaborative problem solving related to authentic local and global issues.
#6. Assessment. The teacher understands and uses multiple methods of assessment to engage learners in their own growth, to monitor learner progress, and to guide the teacher's and learner's decision making.
#7. Planning for Instruction. The teacher plans instruction that supports every student in meeting rigorous learning goals by drawing upon knowledge of content areas, curriculum, cross-disciplinary skills, and pedagogy, as well as knowledge of learners and the community context.
#8. Instructional Strategies. The teacher understands and uses a variety of instructional strategies to encourage learners to develop deep understanding of content areas and their connections, and to build skills to apply knowledge in meaningful ways.

ACEI: Association for Childhood Education International - Standards for elementary level teacher preparation:

1.0 Development, Learning, and Motivation--Candidates know, understand, and use the major concepts, principles, theories, and research related to development of children and young adolescents to construct learning opportunities that support individual students' development, acquisition of knowledge, and motivation.
2.2 Science— Candidates know and understand fundamental concepts of physical, life, and earth/space sciences as delineated in the National Science Education Standards. Candidates can design and implement age-appropriate inquiry lessons to teach science, to build student understanding of personal and social applications, and to convey the nature of science. (INTASC #1 Subject Matter Knowledge)
2.6 Health education— Candidates know, understand, and use the major concepts in the subject matter of health education to create opportunities for student development and practice of skills that contribute to good health. (INTASC #1 Subject Matter Knowledge)
3.1 Integrating and applying knowledge for instruction— Candidates plan and implement instruction based on knowledge of students, learning theory, connection across the curriculum, curricular goals, and community. (INTASC #7 Planning)
#4.0 Assessment for Instruction -- Candidates know, understand and use formal and informal assessment strategies to plan, evaluate and strengthen instruction that will promote continuous intellectual, social, emotional, and physical development of each elementary student.

Technology (ISTE NETS): International Society for Technology in Education / National Educational Technology Standards

Standard I. Teachers use their knowledge of subject matter, teaching and learning, and technology to facilitate experiences that advance student learning, creativity, and innovation in both face-to-face and virtual environments.

COURSE DELIVERY
Face to face, field-based, with some on-line sessions

REQUIRED TEXTS & READINGS
All readings will be provided via electronic chapters via Blackboard.

Board of Education, Commonwealth of Virginia. (2010). Standards of learning for Virginia Public Schools: Science Available online:
http://www.doe.virginia.gov/testing/sol/standards_docs/science/complete/stds_sciencek-12.doc

Optional Texts:
Inquire with Dr. G, if you are interested in finding titles with ideas for teaching elementary science. You can consider any elementary science teaching text as a resource for lesson ideas and support for theoretical underpinning regarding your pedagogical approaches. Glad to provide guidance here.

COURSE ASSIGNMENTS AND EXAMINATIONS (These assignments count for course EDCI 553):

    1. Attendance and Participation   **10%**

It is expected that you attend all scheduled classes and asynchronous online meetings outlined within the syllabus. Absence from class to observe a religious holiday, to serve jury duty, or to participate in required military service, and medical emergencies are exceptions to the above policy. If you anticipate being absent for any of these reasons, please make arrangements in advance. This is a time intensive course and missing time will most certainly impact your ability to meet the goals of the course. In addition, this class operates with the assumption that *knowledge is socially constructed* and the most meaningful learning opportunities are those where you have the opportunity to offer and explore diverse perspectives with peers; therefore, you are expected to contribute to both class and online discussions and activities as well as genuinely listen to peers as they do the same. In addition, you should be prepared for each class, which means having completed all assigned readings and tasks for that class. Cell phones are for emergency use only and it is expected that you will not use cell phones in class for purposes such as texting, social media, or phone calls.

    2. Wonder Journal   **20%**

Think about the science that you see in the everyday. Ask yourself questions, feel the movements and forces while you drive, look at the sky, watch your pet, engage with another human, think about your place in this world, go for a long walk and just think...no phone, no worries, just get lost in your thoughts. Remember this is homework so you have an excuse. Over the course of the semester…use a composition book/journal to make note of various things that you observe in the natural world around you and list, sketch, question, observe and record those things that capture your attention and imagination. These wonderings about the natural world are just that…what do you see, feel and think about those things that fascinate and frustrate you to think about. We will intentionally slow down and use old technology (paper and pencil) to engage with our wonders. There are no real rules here. Well, I lied, there are two rules…1) you will need to complete 10 entries total (more is fine); 2) we will turn in our journals in class in week four. Your wonders are yours and unique to how you envision the world around you. "Dance like nobody is watching" while you build your entries.

    3. Longitudinal Reading Logs   **20%**

a. You will analyze each reading in terms of the reading and its connection to your school site and your unit. Record these responses in your longitudinal reading log for each reading. Use the template provided in Bb. Your reflection should…
   1. be completed before the class period begins.
   2. be brief, yet thoughtful, and demonstrate genuine consideration of the text
   3. be accessible during <u>each</u> class session.

These will help in the construction and support of both your science unit and differentiation plan.

4. Inquiry-Based Unit Project   **40%**

The goal of this project is construct and teach (a small portion) an inquiry-based unit within your field site. We will design this work around the 5 E model of lesson planning. The unit will entail building a detailed and well-supported narrative description for the approach that will be employed. The lesson sequence will build science content understanding in engaging and dynamic ways for students within your field site and provide some key theoretical and research-based support for the content, approach and activities constructed. The unit will be scored via the rubric provided later in the syllabus as part of the PBA for science. *This will be connected to your PBL assignment with Dr. Bean.*

5. In-class assignments (TBA)   **10%**

GRADING POLICIES:

A=94-100; A-=90-93; B+=87-89; B=80-86; C=70-79; F=below 70
*Remember: A course grade less than B requires that you retake the course.

WORK TIMELINESS EXPECTATIONS:

It is expected that all class assignments will be submitted on time to the correct location; therefore, **late assignments will not receive full credit**. Assignments turned in late will receive an automatic deduction of one letter grade making the highest possible score equivalent to 80% (B). All assignments must be submitted by the beginning of class (Eastern standard time) on the due date stated within the syllabus (see below) and should only be submitted via **Blackboard**.
If you are unable to complete an assignment due to an emergency or difficult circumstance, communication must be made with the instructor via email or in person. In situations that are deemed an emergency or a difficult circumstance, I will work with you to set a new submission date that will not be considered late.

OTHER EXPECTATIONS

All written papers are **expected to be double-spaced, with 1" margins, and in 12-point font** (Times New Roman, Calibri, or Arial). **APA format is expected**. If you do not have a 6th Edition APA manual, the OWL at Purdue is an excellent resource:
http://owl.english.purdue.edu/owl/resource/560/01/

*Please Note: The GMU Writing Center offers online support via email. They will provide feedback on your writing within one hour. Graduate and professional writing can be difficult; I encourage you to take advantage of this service.
http://writingcenter.gmu.edu/?page_id=177

BLACKBOARD REQUIREMENTS

Every student registered for any Elementary Education course with a required performance-based assessment (designated as such in the syllabus) is required to submit this/these assessment(s) (EDCI 545: Impact on Student Learning Task; EDCI 553 – Science Unit) to Tk20 through Blackboard (regardless of whether a course is an elective, a onetime course or part of an undergraduate minor). Evaluation of the performance-based assessment by the course instructor will also be completed in Tk20 through Blackboard. Failure to submit the assessment to Tk20 (through Blackboard) will result in the course instructor reporting the course grade as Incomplete (IN). Unless this grade is changed upon completion of the required Tk20 submission, the IN will convert to an F nine weeks into the following semester.

Professional Dispositions

Students are expected to exhibit professional behaviors and dispositions at all times.

Core Values Commitment

The College of Education and Human Development is committed to collaboration, ethical leadership, innovation, research-based practice, and social justice. Students are expected to adhere to these principles: http://cehd.gmu.edu/values/.

GMU Policies and Resources for Students

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see http://oai.gmu.edu/the-mason-honor-code/).

- Students must follow the university policy for Responsible Use of Computing (see http://universitypolicy.gmu.edu/policies/responsible-use-of-computing/).

- Students are responsible for the content of university communications sent to their Mason email account and are required to activate their account and check it regularly. All communication from the university, college, school, and program will be sent to students **solely** through their Mason email account.

- Students with disabilities who seek accommodations in a course must be registered with George Mason University Disability Services. Approved accommodations will begin at the time the written letter from Disability Services is received by the instructor (see http://ods.gmu.edu/).

- Students must follow the university policy stating that all sound emitting devices shall be silenced during class unless otherwise authorized by the instructor.

Campus Resources

- Support for submission of assignments to Tk20 should be directed to tk20help@gmu.edu or https://cehd.gmu.edu/aero/tk20. Questions or concerns regarding use of Blackboard should be directed to http://coursessupport.gmu.edu/.

- The Writing Center provides a variety of resources and services (e.g., tutoring, workshops, writing guides, handbooks) intended to support students as they work to construct and share knowledge through writing (see http://writingcenter.gmu.edu/).

- The Counseling and Psychological Services (CAPS) staff consists of professional counseling and clinical psychologists, social workers, and counselors who offer a wide range of services (e.g., individual and group counseling, workshops and outreach programs) to enhance students' personal experience and academic performance (see http://caps.gmu.edu/).

- The Student Support & Advocacy Center staff helps students develop and maintain healthy lifestyles through confidential one-on-one support as well as through interactive programs and resources. Some of the topics they address are healthy relationships, stress management, nutrition, sexual assault, drug and alcohol use, and sexual health (see http://ssac.gmu.edu/). Students in need of these services may contact the office by phone at 703-993-3686. Concerned students, faculty and staff may also make a referral to express concern for the safety or well-being of a Mason student or the community by going to http://ssac.gmu.edu/make-a-referral/.
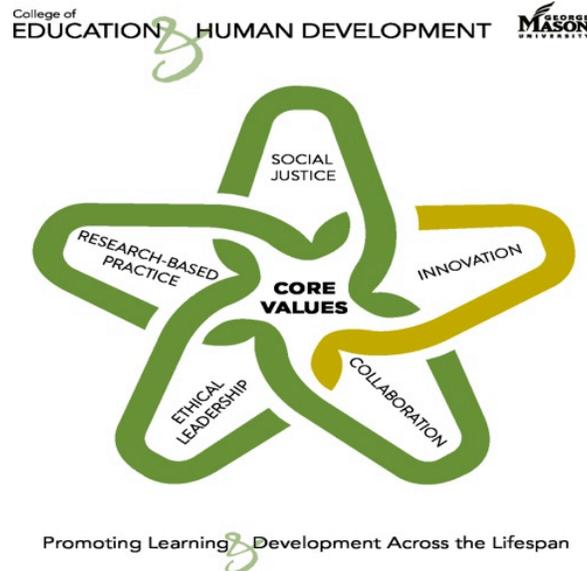
For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See http://gse.gmu.edu/].

Emergency Procedures
You are encouraged to sign up for emergency alerts by visiting the website https://alert.gmu.edu.
There are emergency posters in each classroom explaining what to do in the event of crises.
Further information about emergency procedures exists on http://gmu.edu/service/cert

Memo:

To: all CEHD students seeking student teaching internships in spring 2018 and forward

From: Jeff Davis, Director of Educator Preparation, CEHD

Re: Internship application requirements

Date: May 1, 2017

Students – please note the following requirements for Spring 2018 internship applications. **No extensions to the application deadlines will be given for missing/incorrect/failing test scores, missing endorsements, or missing/incorrect CPR/AED/First Aid certifications**.

Student Clinical Practice: Internship Application Requirements

TESTING
Since 2015, internship applications must include **all** official and passing test scores must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the internship application deadline. Allow a **minimum** of six weeks for official test scores to arrive at Mason. Testing too close to the application deadline means scores will not arrive in time and the internship application will not be accepted.

For Spring 2018 internships, this means that the latest you could test in time for scores to be reported to Mason by September 15th is **August 1st**.

Required tests:

Praxis Core Academic Skills for Educators Tests (or qualifying substitute)
VCLA
RVE (specific programs only…see link below)
ACTFL (Foreign Language only…unofficial scores are acceptable *for this test only*)
Praxis II (content knowledge exam in your specific endorsement area)
For details, please check http://cehd.gmu.edu/teacher/test/

ENDORSEMENTS

Please note that ALL endorsement coursework must be completed, with all transcripts submitted and approved by the CEHD Endorsement Office, prior to the internship application deadline. Since the internship application must be submitted in the semester prior to the actual internship, please make an appointment to meet with the Endorsement Specialist and plan the completion of your Endorsements accordingly.

CPR/AED/First Aid – **NEW hands-on training required for licensure!**
Due to a recent change in Virginia law, effective July 1, 2017, all new license applications and license renewals must include verification that "hands-on" First Aid/CPR/AED training was completed. This means that applications for spring 2018 internships must also include verification of completing "hands-on" training. After June 30, 2017, the online training will no longer be accepted.

Emergency First Aid, CPR, and Use of AED Certification or Training requirement must be submitted and in the Mason system (i.e. Banner/PatriotWeb) by the application deadline. Students must submit one of the "acceptable evidence" documents listed at http://cehd.gmu.edu/teacher/emergency-first-aid to CEHD Student and Academic Affairs. In order to have the requirement reflected as met in the Mason system, documents can be scanned/e-mailed to CEHDacad@gmu.edu or dropped-off in Thompson Hall, Suite 2300.

DYSLEXIA AWARENESS TRAINING – NEW requirement for licensure!
Effective July 1, 2017, every person seeking initial licensure or renewal of a license shall complete awareness training, provided by VDOE, on the indicators of dyslexia, as that term is defined by the board and regulations, and the evidence-based interventions and accommodations for dyslexia. The training module is located at http://www.doe.virginia.gov/teaching/licensure/dyslexia-module/story.html.
Similar to the Child Abuse Prevention Module, students will need to save and print out the completion certificate at the end of the module.

BACKGROUND CHECKS/FINGERPRINTING
All local school systems require students to complete a criminal background check through their human resources office (not through George Mason University) **prior to beginning the internship**. Detailed instructions on the process will be sent to the student from either the school system or Mason.

When applying for their background check/fingerprinting, students are **strongly advised** to disclose any/all legal incidents that may appear on their records. School divisions can and will withhold internship placement if discrepancies are found between a student's disclosure and their official judicial record. Students must assume the risk that classes may be deferred and their program progress delayed or altered due to the individual severity of notations on such a check and review by individual agencies.

PLEASE NOTE:
Your G# must be clearly noted (visible and legible) on the face of any & all documents that you submit.

APPLICATION
The internship application can be downloaded at http://cehd.gmu.edu/teacher/internships-field-experience

DEADLINES
Spring 2018 internship application deadline:

* Traditional Internship: September 15, 2018
* On-the Job Internship: November 1, 2018

If you have any questions about the above requirements, **don't wait** - please contact your advisor or the Clinical Practice Specialist at internsh@gmu.edu Please be sure to include your G# and program/content area information in your email.

This communication to you, including all requirements and deadlines, will be referenced upon receipt of any request for application deadline extension.

Inquiry-based Unit Rubric (PBA - 40%)

Description and standard addressed	Exceeds Expectations – 4	Meets Expectations – 3	Does Not Meet Expectations – 2	Does Not Meet Expectations – 1
A. Overview (Background; content and context description) INTASC: #4, 5, 7; ACEI: #1, 2.2, 3.1 (5 pts)	Give excellent insight into key content ideas, provides powerful description of unit goals. Excellent listing and engagement for the content background teachers would need to know to carry out lesson goals. Excellent description of school and students that the unit is designed.	Give insight into the content and include several key content ideas. Lists and engages the content background teachers would need to know to carry out lesson goals. Provides a solid description for the school and students that the unit is designed.	Does not provide insight into the content and include several key content ideas. Does not completely provide the content background for teachers. Does not provide a detailed description of the school and students.	Missing
B. Curriculum Design and Assessment (Theoretical background) (10 pts) INTASC: #8, 6 ACEI: #1, 4	Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. Uses a myriad of excellent and well-respected sources properly referenced within narrative descriptions. Describes diagnostic, formative and summative approaches throughout the unit.	Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. uses dependable sources that properly referenced within narrative descriptions. Describes diagnostic, formative and summative approaches throughout the unit.	Does not provide complete descriptions or theoretical background; and/or is not self-explanatory. Does not utilize reputable sources within narrative descriptions and/or more needed clarity within narrative. Does not include all three types of assessment.	Missing
C. Detailed Lesson plans (Lesson Framework, pedagogical process & procedure) INTASC: #5, 7, 8 ACEI: #1.0, 2.2, 3.1 (12 pts)	Standards, objectives and lesson activities all seamlessly align and support one another. Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. Clearly described, highly usable and innovative ideas with original elements; addresses issues of safety	There exists alignment between standards, objectives and they support lesson approach. Utilizes inquiry-based lesson model (5E's), clearly describes pedagogical process that embodies inquiry. Effectively describes, usable and effective ideas; addresses issues of safety	Standards, objectives and activities not clearly aligned or appropriate for the lesson. Difficult to use; does not have complete components; and/or is not self-explanatory. Does not address safety.	No consistent format nor serious professional commitment to student needs.

D. Assessment INTASC: #6 ACEI #4 (5 pts)	Innovative, well-supported assessment strategies clearly linked to objectives; demonstrates all stated objectives, copies of assessments included. Includes diagnostic, formative and summative approaches throughout the unit.	Assessment clearly linked to objectives; demonstrates nearly all stated objectives, copies of written assessments are attached. Includes diagnostic, formative and summative approaches throughout the unit.	Assessment is not clearly linked to objectives; demonstrates some stated objectives, and/or copies of written assessments are not attached. Does not provide differing types of assessment strategies.	Missing
E. Support materials INTASC: #4, 5, 8 ACEI #1, 2.2 (5 pts)	Innovative materials used throughout that incorporates engaging, developmentally appropriate and scientifically accurate approaches; multiple connections are made to students' everyday lives and accessible.	Some innovative materials used throughout that incorporates engaging, developmentally appropriate and scientifically accurate approaches. These approaches make attempts to connect to students' everyday lives.	Lacks innovation and does not include activities that support inquiry. Activities might contain some scientific inconsistencies; little effort to connect to students everyday lives.	Missing
F. References cited. (3 pts)	Uses well-respected sources properly referenced with no errors.	Uses well-respected sources properly referenced, but with a few small errors.	Mistakes in formatting and does not utilize well-respected reference materials.	Missing