

George Mason University
College of Education and Human Development
Secondary Education Program
SEED 673-001/483-001:

ADVANCED METHODS OF TEACHING SCIENCE IN THE SECONDARY SCHOOL
SPRING 2020 – 3 Credits - Fairfax

College of
EDUCATION HUMAN DEVELOPMENT GEORGE
MASON



Promoting Learning Development Across the Lifespan

INSTRUCTOR:
DATE AND TIME:

Dr. Stephen Burton
Jan 25 – May 7
Mondays 4:30-7:20 pm

CLASS LOCATION:
TELEPHONE:

<http://bit.ly/3hJovPj>
616-502-2175

E-MAIL:
OFFICE HOURS:

sburton7@gmu.edu
By appointment

COMMUNICATION: Email is the best form of communication. During usual circumstances, turnaround time is 24-36 hours. You can also reach me on my cell phone at 616-502-2175. However, please text me first using asking if I can receive a call at that time. If I do not respond right away, then I am unavailable. I will, text back later and we can schedule a time to talk on the phone.

REQUIRED ELECTRONIC TEXTS: We will have required readings from an **NSTA class bundle**, consisting of various books and journals (and sometimes webinars) from the National Science Teacher Association (NSTA) – our national organizing body. The purchase of these electronic materials also gives you a membership to NSTA, which opens up a great deal of resources to you. We are doing this instead of having one book for two reasons:

1. NSTA is an important organization to know over the course of your career as a science teacher – they are a premiere organization in professional development- and you should get to know them and get involved as soon as possible
2. NSTA peer-reviews all of their work, so their professional development materials are the best available – and the biggest body of materials as well

If you took Science Methods 1 during the Fall of 2020, you should have already paid for the year-long course pack. You will not need to purchase the course pack again. However, if you did not take Science Methods 1 in the Fall of 2020 OR chose not to purchase the course pack, you will need to make the purchase. ***INSTRUCTIONS FOR PURCHASING THE NSTA LEARNING CENTER (NSTA LC) CAN BE FOUND HERE: <http://bit.ly/2ZvDYtv>.***

PREREQUISITE: Students must also complete 15 hours of field experience. SEED 473 for SEED 483, SEED 573 for SEED 673.

UNIVERSITY CATALOG COURSE DESCRIPTION: Provides advanced study of teaching and curriculum development based on research and current issues. Emphasizes integrating science and technology and adapting instruction to the needs of diverse learners. School-based field experience required. Offered by Graduate School of Education. May not be repeated for credit.

COURSE OVERVIEW: SEED 483/673 is the second course in a two-course sequence of science methods courses for students seeking a secondary school teaching license in earth science, biology, chemistry, or physics. The course builds on students' knowledge of their subject matter and from their first science methods course. The course focuses on using technology in science teaching and learning and meeting the diverse needs of learners as called for by the *Standards of Learning for Virginia Public Schools* and *National Science Education Standards* and as outlined by the National Council for Accreditation of Teacher Education (NCATE), the National Science Teachers Association (NSTA), and the Interstate New Teacher Assessment and Support Consortium (INTASC). SEED 483/673 introduces students to integrating technology in learning and teaching science, adapting inquiry-based lessons, assessment techniques, and the diverse needs of students.

COURSE DELIVERY METHOD: SEED 483/673 will be fully online during the Spring 2021 semester. This designated as a lecture course; however, students are expected attend class prepared and actively participate in discussions and other hands-on learning experiences. Under no circumstances, may candidates/students participate in online class sessions (either by phone or Internet) while operating motor vehicles. Further, as expected in a face-to-face class meeting, such online participation requires undivided attention to course content and communication.

Technical Requirements – the course will consist of both synchronous and asynchronous digital interactions using Cisco Webex – below is the full information regarding connecting to the class meeting site:

Meeting link (shortened to a bitly link above):

<https://gmu.zoom.us/j/96604843570?pwd=RUNOR3NTL0RMSmU3WDlnTkN3THpOUT09>

Meeting ID: 966 0484 3570

Passcode: 266488

One tap mobile

+12678310333,,96604843570#,,,,*266488# US (Philadelphia)

+13017158592,,96604843570#,,,,*266488# US (Washington D.C)

COURSE MATERIALS ONLINE: For dissemination of information, we will be using the website <https://sites.google.com/site/gmuscimethods/home>. Materials will be added throughout the semester based upon needs from the course. The Blackboard site, found at <http://mymasonportal.gmu.edu>, will be used primarily for submitting assignments and grades. Use the same login as your GMU email for the Blackboard Sites.

GOOGLE SITES: The Unit Plan assignment you will be completing will initially posted through a website YOU WILL AUTHOR using Google Sites (<https://sites.google.com/>). To create a website with Google Sites, you will need to sign up for a Gmail email account (if you do not already have one).

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 <https://ready.gmu.edu/>.

BIG IDEAS IN SCIENCE EDUCATION: During this semester, we will continue focusing on helping you begin your journey to becoming a reflective practitioner of reformed science education practices. We will focus on the following big ideas as a way to frame your understanding of effective science education practices throughout both Science Methods I and Science Methods II.

- Our job is to help students figure out how to be lifelong learners
- The more students figure out answers to tough questions on their own, the more they will trust they can learn on their own
- Science is a process that uses evidence to think critically and explain the natural world
 - Process leads to the knowledge we currently teach as facts
 - If students don't experience the process, they won't value its ability to explain the natural world – plus they will only see science as a collection of facts
- Know your students – get into their heads when designing lessons
- Have a theory of learning – it is what should guide your instruction as you develop lessons
- Know what you want your students to be able to do and how you will assess it before you design any instruction
- Measure everything you do against student learning
- You don't have to reinvent the wheel, but do need to customize it based on your learning theory and unit objectives

LEARNING GOALS, OBJECTIVES AND ASSESSMENTS: Below is a list of the major goals with specific objectives and the assessments that will allow you to show that you have achieved those goals.

Goal 1: Build a learning theory for developing and implementing lessons

Objective	Assignment	Who must do this?
Students will be able to explain why a student-centered approach to learning is effective in learning	Research Review	Methods I and II – Grad Students Only
Students will be able to describe, with evidence, how a unit plan does or does not align with the constructivist learning theory.	Learning Theory Alignment	Methods II
Student will be able to design lessons that clearly reflect a constructivist learning theory	Lessons (Both), Unit Plan (MII), Microteaching Reflection (Both) Learning Theory Alignment (MII)	Methods I and II
Students will be able to explain how the 5-E lesson design, the Learning Cycle, and a student-centered learning theory are effective ways to think about learning and lesson design	Learning Theory Alignment	Methods I and II

Goal 2: Do science to understand how science is done (COMPLETED IN METHODS I)

Objective	Assignment	Who must do this?
Students will be able to conduct an investigation that results in new scientific knowledge	Nature of Science Assignment	Methods I
Students will be able to explain the epistemic features and unique characteristics (NOS) of science	Nature of Science Assignment	Methods I

Goal 3: Recognize that inquiry learning using scientific practices has inherent risks that should be identified and addressed such that students learn to do science in an ethical and safe manner.

Objective	Assignment	Who must do this?
Students will be able to explore the web to describe the major safety and ethical concerns associated with conducting science in the classroom	Safety Assignment	Methods I
Students will be able to describe means to reduce the potential safety risks involved in conducting scientific investigations in the classroom while not compromising the benefit the students get while conducting inquiries	Safety Assignment	Methods I
Students will be able to design lessons and clearly indicate within the lesson: safety concerns, how to reduce them and what to do when accidents happen	Lessons (Both), Unit Plan (MII)	Methods I and II

Goal 4: Develop an understanding of how inquiry can develop both scientific thinking and content knowledge

Objective	Assignment	Who must do this?
Students will be able to explain what inquiry in a science class looks like	Reflection Questions	Methods I and II
Student will develop lessons that are inquiry-focused	Lessons (Both), Unit Plan (MII)	Methods I and II
Students will be able to explain Model-Based Inquiry and its potential impact on helping students learn science content and scientific thinking	Research Review	Methods II
Students will be able to develop lessons that incorporate Model-Based Inquiry	Lessons (Both), Unit Plan (MII)	Methods I and II
Students will be able to explain Cognitive Apprenticeships and its potential impact on helping students learn science content and scientific thinking	Research Review	Methods I and II
Students will be able to develop lessons that incorporate Cognitive Apprenticeships	Lessons (Both), Unit Plan (MII)	Methods I and II

Goal 5: Understand how to develop effective lessons and units with backwards design

Objective	Assignment	Who must do this?
Student will be able to apply the basic premise and order of backwards design	Lessons (Both)	Methods I and II
Students will use the basic organization of backwards design to develop a lesson plan	Lessons (Both), Unit Plan (MII)	Methods I and II
Students will be able to write measurable objectives	Lessons (Both),	Methods I and II

	Unit Plan (MII)	
Students will be able to describe how teaching activities support student achievement of measurable objectives	Lessons (Both), Unit Plan (MII), Microteaching Reflection (Both)	Methods I and II
Students will be able to describe how assessments evaluate student achievement of the measurable objectives	Lessons (Both), Unit Plan (MII), Microteaching Reflection (Both)	Methods I and II

Goal 6: Develop skills as reflective practitioners.

Objective	Assignment	Who must do this?
Students will be able to effectively examine classrooms using their learning theory as a lens and student behavior, engagement, and learning (when possible) as the evidence	Field Experience Paper (Both)	Methods I and II
Students will be able to examine use assessment data to reflect on and improve upon lessons	Microteaching Reflection (Both)	Methods I and II

PROFESSIONAL ASSOCIATION STANDARDS (MET THROUGH SEED 483/673)

The course focuses on the teaching of science as called for by the state and national science standards and as outlined by the National Council for Accreditation of Teacher Education (NCATE), the National Science Teachers Association (NSTA), and the Interstate New Teacher Assessment and Support Consortium (INTASC). SEED 573 builds a repertoire of science teaching and assessment strategies to facilitate student learning.

The pre-service and provisionally licensed teacher will:

- Understand the relationship of assessment in understanding student learning and informing instruction; RESEARCH-BASED PRACTICE; SPA STANDARD 2c, 5a, 5b, 5c
- Design evidence-based assessment techniques in science instruction; RESEARCH-BASED PRACTICE; SPA STANDARD 2c, 5a, 5b, 5c
- Build a repertoire of science teaching and assessment strategies using technology to help students become scientifically literate, think critically and creatively, and see relationships among science, technology, and society; RESEARCH-BASED PRACTICE; INNOVATION; COLLABORATION; SPA STANDARDS 2, 3, 4, 5
- Critique, adapt, and construct standards-based lessons including assessment and hands-on experiences for the diverse needs of learners including gender equity, cultural diversity, English language learners, gifted/talented students, and students with learning, physical, social, and emotional challenges. RESEARCH-BASED PRACTICE; SOCIAL JUSTICE; ETHICAL LEADERSHIP; SPA STANDARDS 2, 3, 4, 5

ASSIGNMENTS: Findings from science education research shows that frequent assessment of small amounts of material is most effective for learning science. Therefore, in this class formal and informal assessment will be continuously provided on assignments and class activities. Assessment is a two-way communication loop that informs both learning and teaching. See Assignments section of the Syllabus for a description of the assignment.

Assessments	SEED 483	SEED 673	Tentative Due Date
Unit Plan (PBA)			
Planning Project	5	5	12-Feb
Unit Plan Overview (done in parts)	5	5	19-Feb
Lessons – 3 Individual Lessons			
Lesson 1 – Opening	5	5	6-Mar
Lesson 2 – Inquiry and Personalized	10	10	5-Apr
Lesson 3 -	15	15	17-Apr
Remaining components of unit plan (including assessment map)	10	10	26-Apr
Learning Theory Alignment	5	5	26-Apr
Clinical Assignments			
Lesson Analysis	10	10	4-May
Clinical Experience Reflection Paper	10	10	4-May
Other Assessments			
Research Review	5	5	28-Feb
Candidate Disposition/Professionalism	20	20	NA
Total Points	100	100	

COURSE PERFORMANCE EVALUATION: All assignments for this course will be submitted to Blackboard from evaluation. In addition, Google Sites will be used for the Unit Plan

GRADING: High quality work and participation is expected on all assignments and in class. **Attendance at all classes for the entire class is a course expectation. For each unexcused absence, the course grade will be reduced by 5% points.** All assignments are graded. Each graded assignment will be assessed using a scoring rubric which will be handed out before the assignment is due. All assignments are due at the beginning of class on the day they are due. Completing work ahead of the scheduled due date is acceptable and encouraged. There are many assignments in this course, so staying organized and on top of the schedule is important for success. Graded assignments that are late will automatically receive a ten percent grade reduction (one full letter grade lower). **After 5 days, any assignments still late will not be accepted unless prior arrangements have been made with the instructor.**

GRADING SCALE		POLICY ON INCOMPLETES
Undergraduate	Graduate	If circumstances warrant, a written request for an incomplete must be provided to the instructor for approval prior to the course final examination date. Requests are accepted at the instructor's discretion, provided your reasons are justified and that 80% of your work has already been completed. Your written request should be regarded as a contract between you and the instructor and must specify the date for completion of work. This date must be at least two weeks prior to the university deadline for changing incompletes to letter grades.
A = 93-100% A- = 90-92% B+ = 86-89% B = 82-85% B- = 80-81% C = 70-79% D = 60-69% F = Below 70%	A = 95-100% A- = 90-94% B+ = 87-89% B = 83-86% B- = 80-82 C = 70-79% F = Below 70%	

FIELD EXPERIENCE SIGNUP: Per state guidelines, you are required to complete 15 hours of fieldwork during this class. For more information about field placement, go to <https://cehd.gmu.edu/epo/field-experience>. Additionally, please answer the survey sent by Dr. Zenkov. If you have missed this survey, go to <http://cehd.gmu.edu/endorse/ferf> to sign up for your placement.

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/>.

PROFESSIONAL DISPOSITIONS: Students are expected to exhibit professional behaviors and dispositions at all times. See <https://cehd.gmu.edu/students/polices-procedures/>

GMU POLICIES AND RESOURCES FOR STUDENTS:

Policies

- Students must adhere to the guidelines of the Mason Honor Code (see <https://catalog.gmu.edu/policies/honor-code-system/>).
- 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 <https://ds.gmu.edu/>).
- Students must silence all sound emitting devices 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/>.
- For information on student support resources on campus, see <https://ctfe.gmu.edu/teaching/student-support-resources-on-campus>

For additional information on the College of Education and Human Development, please visit our website <https://cehd.gmu.edu/students/> .

Day	Date	Topic
Mon	25-Jan	Overview of Course
		Establishing course norms
		Introduce Research Review
Mon	1-Feb	Individual work - Research Review - Parts 1-3
Sun	7-Feb	Assignment Due: Complete Research Review - Parts 1 - 3
Mon	8-Feb	Identifying Big Ideas and Key Concepts
		Using big ideas and key concepts to identify potential real-world problem/project-based learning experiences
		Sequencing the course into a progression of learning
Sun	14-Feb	Assignment Due: Complete Research Review - Parts 4-5
Mon	15-Feb	Identifying final products and gapless explanations (Video)
		Individual Meetings - Planning Project + Final Assessment Product
Sun	21-Feb	Assignment Due: Unit Plan - Planning Project- Draft - content and organization - on website
Mon	22-Feb	Individual Meetings – Creating gapless explanation and doing final product – to identify specific objectives and skills necessary for the unit
Mon	1-Mar	Individual Meetings – Creating gapless explanation and doing final product – to identify specific objectives and skills necessary for the unit
Sun	7-Mar	Assignment Due: Complete Research Review - Part 6
Mon	8-Mar	Identifying preconceptions and prior knowledge
		Sequencing learning targets into a progression
Sun	14-Mar	Assignment Due: Unit Plan Overview – Draft – (includes final product overview and standards) – on website
Sun	14-Mar	Assignment Due: Unit Plan Objectives – Draft – on website
Mon	15-Mar	Engaging students in inquiry
		Thinking scientifically
		Implementing formative assessments
		Providing wrap-up and sensemaking opportunities
		Individual Meetings - Unit Plan Overview and Objectives and Lesson 1 - Kickoff Lesson Planning
Sun	21-Mar	Assignment Due: Lesson 1 Draft – Opening Lesson - on website
Mon	22-Mar	Believe All Students Can Learn: Personalized Learning and Constructivism
		Providing feedback
		Providing opportunities for practice, review, and revision
		Providing wrap-up and sensemaking opportunities
		Individual Meetings - Lesson 1 (feedback for revision) & Lesson 2 - Inquiry (planning)

Day	Date	Topic
Sun	28-Mar	Assignment Due: Lesson 2 Draft – Inquiry and Personalized Lesson - on website
Mon	29-Mar	Incorporating Technology in your Instruction
		Individual Meetings - Lesson 2 (feedback for revision) & Lesson 3 (planning)
Mon	5-Apr	Individual Work - Lesson 3
Sun	11-Apr	Assignment Due: Lesson 3 Draft – Personalized Lesson - on website
Mon	12-Apr	Individual Meetings - Lesson 3 – feedback for revision
Sun	18-Apr	Assignment Due: Lesson 3 Draft – Personalized Lesson - on website
Mon	19-Apr	Individual Meetings - Lesson 3 – feedback for revision
Sun	25-Apr	Assignment Due: Assessment Map - on website
Sun	25-Apr	Assignment Due: Draft Remaining Lessons - on website
Tue	26-Apr	Individual Meetings - Unit Plan Feedback - for Revision
Sun	2-May	Assignment Due: Final Unit Plan Revision
Sun	2-May	Assignment Due: Learning Theory Alignment
Tue	3-May	Sharing Unit Plans - Final Reflections
Thu	7-May	Assignment Due: Lesson Analysis
Thu	7-May	Assignment Due: Clinical Experience Reflection

ASSIGNMENTS:

ALL ASSIGNMENT INSTRUCTIONS ARE POSTED ON BLACKBOARD – THE INSTRUCTIONS GIVEN ON THE SYLLABUS ARE FOR DESCRIPTIVE PURPOSES ONLY

In-Class Assignments:

- Professionalism – over the semester, your professional behavior will be evaluated. Professional behavior such as authentic effort, collaboration, and reflection will be based on (submitted to Reflection Journal in MyMason):
 - PRODUCT: Reading and Reflection Questions
 - PRODUCT: Interaction with the professor and preservice teacher colleagues
 - PRODUCT: Timeliness and quality of submitted assignments (quality evaluated on authentic effort)
- Unit Plan - Design a unit (lasting at least 5 days) - build on google sites
 - PRODUCT – Planning Project
 - PRODUCT – Overview
 - PRODUCT – 3 in-depth lesson plans with support materials
 - Lesson 1 – Opening Lesson
 - Lesson 2 – Inquiry and Personalized Lesson
 - Lesson 3 – Personalized Lesson
 - PRODUCT – Remaining lessons of unit (short-version) and support materials
 - PRODUCT – Assessment Map
 - PRODUCT – Learning Theory Alignment
- Research Review – explore the educational research on science specific teaching strategies – (submitted to MyMason)
 - PRODUCT – Part 1 – orientation toward educational research – Discussion Board
 - PRODUCT – Part 2 – Identifying examples of resources – Discussion Board
 - PRODUCT – Part 3 – Summarizing and applying the research - Discussion Board

Field Experience:

- 15 Hours for Science Methods (ideally 5 days, 3 hours per day) – move beyond observing to engaging with students (if allowed)
- Lesson Analysis – You will teach a lesson at your school and reflect on the experience - submit to Blackboard assessments
 - PRODUCT: Lesson plan – submit to Blackboard Assessments
 - PRODUCT: Reflection – submit to Blackboard Assessments - 8 pages maximum
- Clinical Experience Reflection – Submit to Blackboard assessments
 - PRODUCT: Turn in a log sheet, signed by the teacher(s) showing you completed the 15 hours of field experience.
 - PRODUCT: Written Summary (5 pages maximum - 2 pages maximum for each area of focus)

RECOMMENDED ONLINE RESOURCES:

- Achieve, Inc. on behalf of the twenty-six states and partners that collaborated on the NGSS (2013). Next Generation Science Standards (2013). Achieve, Inc. Retrieved on Dec 28, 2019 from <http://www.nextgenscience.org/next-generation-science-standards>
- Commonwealth of Virginia (2018). *Standards of Learning for Virginia Public Schools*. Richmond, Virginia. Retrieved on Dec 28, 2019 from http://www.doe.virginia.gov/testing/sol/standards_docs/science/2018/index.shtml
- National Research Council (1996). *National science education standards*. Washington, DC: National Academy Press. Retrieved on Dec 28, 2019 from http://www.nap.edu/openbook.php?record_id=4962
- American Association for the Advancement of Science (1993). *Benchmarks for Science Literacy*. Retrieved on Dec 28, 2019 from <http://www.project2061.org/publications/bsl/online/index.php>
- McComas, W. F. (1998). *The principle elements of the nature of science: Dispelling the myths*. Retrieved on Dec 28, 2019 from http://www.pestl.org/images/The_Myths_of_Science_Article_by_McComas.pdf.
- Peters, E. E. (2006). *Why is teaching the nature of science so important?* Retrieved on Dec 28, 2019 from http://www.auburn.edu/~cgs0013/Schnittka_timeline.pdf
- Dagher, Z. R. & Erduran, S. (2017). Abandoning patchwork approaches to nature of science in science education. *Canadian Journal of Science, Mathematics, and Technology Education*, 17(1), 46-52. <http://dx.doi.org/10.1080/14926156.2016.1271923>.
- American Chemical Society (2007). *Educators & Students page*. Retrieved on Dec 28, 2019 from <https://www.acs.org/content/acs/en/education.html>
- American Chemical Society (2003). *Chemical Science Safety in the Classroom*. Retrieved on Dec 28, 2019 from <https://www.acs.org/content/acs/en/education/policies/safety.html>
- U.S. Government Printing Office (2007). *Code of Federal Regulations*. Retrieved on Dec 28, 2019 from <https://www.govinfo.gov/content/pkg/CFR-2007-title45-vol1/pdf/CFR-2007-title45-vol1.pdf>
- U.S. Department of Labor (2007). *Occupational Health and Safety Administration*. Retrieved on December 28, 2019 from <https://www.osha.gov/laws-regs>
- American National Standards Institute (2007). *American National Standards Institute Homepage*. Retrieved on August 14, 2007 from <http://www.ansi.org/>.
- Maryland Public Schools (2007). *Legal Aspects of Laboratory Safety*. Retrieved on December 28, 2019 from <http://mdk12-archive.msde.maryland.gov/instruction/curriculum/science/safety/legal.html>

Other articles/handouts will be distributed in class or posted on-line at the course website. (Your GMU email address is required for communication with the course instructor and for using Blackboard!)

OTHER RESOURCES

- Barnekow, D. J. (1998). *Graphic organizers for science*. Portland, ME: J. Weston Walsh.
- Bybee, R. W., Powell, J. C., & Trowbridge, L. W. (2008). *Teaching secondary school science: Strategies for developing scientific literacy*. Upper Saddle River, NJ: Pearson.
- Cothron, J. H., Giese, R. N., Rezba, R. J. (2005). *Students and Research*. Dubuque, Iowa: Kendall/Hunt.
- Hassard, J. (2005). *The art of teaching science: Inquiry and innovation in middle school and high school*. New York: Oxford University Press.
- Johnson, D. W. & Johnson R. T. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning*. Boston: Allyn and Bacon.
- Kagan, S. (1994). *Cooperative Learning*. San Clemente, CA: Resources for Teachers, Inc.
- Keely, P., Eberle, F., & Farrin, L. (2005). *Uncovering student ideas in science: 25 formative assessment probes*. Arlington, VA: National Science Teacher Association Press.
- Llewellyn, D. (2002). *Inquire within: Implementing inquiry-based science standards*. Thousand

- Oaks, CA: Corwin Press.
- McComas 2008. Proposal for core nature of science content in popular books on the history and philosophy of science: lessons for science education. In Lee, Y.J. & Tan, A.L. (Eds.) *Science education at the nexus of theory and practice*. Rotterdam: Sense Publishers.
- National Resource Council. (2005). *How Students Learn: Science in the Classroom*. Committee on *How People Learn, A Targeted Report for Teachers*, M.S. Donovan and J.D. Bransford, Editors. Division of Behavioral and Social Science and Education. Washington, DC: The National Academies Press.
- Slavin, R. E. (1995). *Cooperative learning*. Boston: Allyn and Bacon.
- Tomlinson, C. A. (1999). *The differentiated classroom: Responding to the needs of all learners*. Alexandria, VA: Association for Supervision and Curriculum Development.
- Wiggins, G. & McTighe, J. (1998). *Understanding by design*. Alexandria, VA: Association for Supervision and Curriculum Development.

NOTICE OF MANDATORY REPORTING OF SEXUAL ASSAULT, INTERPERSONAL VIOLENCE, AND STALKING: As a faculty member, I am designated as a “Responsible Employee,” and must report all disclosures of sexual assault, interpersonal violence, and stalking to Mason’s Title IX Coordinator per University Policy 1202. If you wish to speak with someone confidentially, please contact one of Mason’s confidential resources, such as Student Support and Advocacy Center (SSAC) at 703-380-1434 or Counseling and Psychological Services (CAPS) at 703-993-2380. You may also seek assistance from Mason’s Title IX Coordinator by calling 703-993-8730, or emailing titleix@gmu.edu.

SUSTAINABILITY AND DISPOSITIONS INFORMATION

SUSTAINABILITY AT GMU

George Mason University is focusing on making our community “greener” and reducing the impact on the environment. This course will contribute to this effort in the following ways. I hope that you will create other ways to contribute to this effort.

- Handouts will be available electronically through the Blackboard platform
- All assignments will be submitted through the blackboard on a Wiki site established for each individual student.
- You should consider reducing waste in your teaching practice (ex: unnecessary paper) and in developing your unit plan
- Incorporate teaching sustainability in the content of your lesson plans (for example, human’s role in reducing their impact on the environment.) Think about what the next generation needs to know about “greening”.

COLLEGE EXPECTATIONS AND UNIVERSITY HONOR CODE

- Students are expected to exhibit professional behaviors and dispositions at all times. See *Graduate School of Education Dispositions for A Career Educator* section below and follow the instructions.
- Students must adhere to the guidelines of the George Mason University Honor Code [See <http://oai.gmu.edu/honor-code/>].
 - Please note the following.
 - “Plagiarism encompasses the following:
 1. Presenting as one’s own the words, the work, or the opinions of someone else without proper acknowledgment.

2. Borrowing the sequence of ideas, the arrangement of material, or the pattern of thought of someone else without proper acknowledgment.” (from Mason Honor Code online at <http://mason.gmu.edu/~montecin/plagiarism.htm>)
 - Paraphrasing involves taking someone else’s ideas and putting them in your own words. When you paraphrase, you need to cite the source using APA format.
 - When material is copied word for word from a source, it is a direct quotation. You must use quotation marks (or block indent the text) and cite the source.
 - Electronic tools (e.g., SafeAssign) may be used to detect plagiarism if necessary.
 - Plagiarism and other forms of academic misconduct are treated seriously and may result in disciplinary actions.
- 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 George Mason University 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.**
 - The George Mason University 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/>].
 - Students with disabilities who seek accommodations in a course must be registered with the George Mason University Office of Disability Services (ODS) and inform their instructor, in writing, at the beginning of the semester [See <http://ods.gmu.edu/>].
 - Students must follow the university policy stating that all sound emitting devices shall be turned off during class unless otherwise authorized by the instructor.
 - The George Mason University Writing Center staff 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 College of Education & 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/>

For additional information on the College of Education and Human Development, Graduate School of Education, please visit our website [See <http://gse.gmu.edu/>].

GRADUATE SCHOOL OF EDUCATION DISPOSITIONS FOR A CAREER EDUCATOR

Students are expected to exhibit professional behavior and dispositions. The Virginia Department of Education and the National Council for Accreditation of Teacher Education promote standards of professional competence and dispositions. Dispositions are values, commitments, and professional ethics that influence behaviors toward students, families, colleagues, and all members of the learning community. The Graduate School of Education expects students, faculty, and staff to exhibit professional dispositions through a:

I. Commitment to the profession

- Promoting exemplary practice
- Excellence in teaching and learning
- Advancing the profession
- Engagement in partnerships

II. Commitment to honoring professional ethical standards

- Fairness
- Honesty
- Integrity
- Trustworthiness
- Confidentiality
- Respect for colleagues and students

III. Commitment to key elements of professional practice

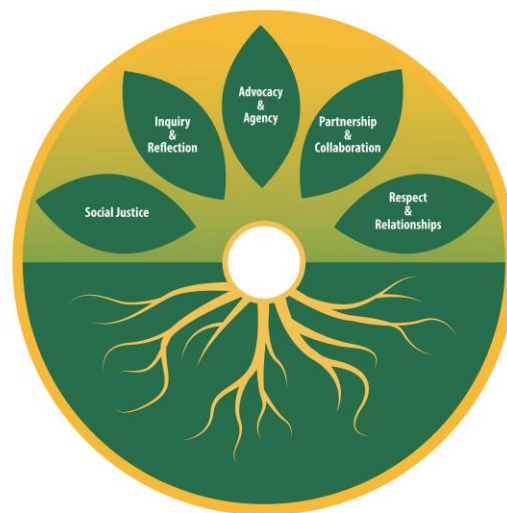
- Belief that all individuals have the potential for growth and learning
- Persistence in helping individuals succeed
- High standards
- Safe and supportive learning environments
- Systematic planning
- Intrinsic motivation
- Reciprocal, active learning
- Continuous, integrated assessment
- Critical thinking
- Thoughtful, responsive listening
- Active, supportive interactions
- Technology-supported learning
- Research-based practice
- Respect for diverse talents, abilities, and perspectives
- Authentic and relevant learning

IV. Commitment to being a member of a learning community

- Professional dialogue
- Self-improvement
- Collective improvement
- Reflective practice
- Responsibility
- Flexibility
- Collaboration
- Continuous, lifelong learning

V. Commitment to democratic values and social justice

- Understanding systemic issues that prevent full participation
- Awareness of practices that sustain unequal treatment or unequal voice
- Advocate for practices that promote equity and access
- Respects the opinion and dignity of others
- Sensitive to community and cultural norms
- Appreciates and integrates multiple perspectives



SEED
SECONDARY EDUCATION

GO TO THE FOLLOWING WEBSITE, DOWNLOAD SIGN AND PROVIDE THE FOLLOWING DOCUMENT AGREEING TO DEMONSTRATE THE ABOVE PROFESSIONAL DISPOSITIONS:
<http://cehd.gmu.edu/assets/docs/cehd/Dispositions%20for%20a%20Career%20Educator.pdf>

IMPORTANT INFORMATION FOR LICENSURE COMPLETION

Student Clinical Practice: Internship Requirements

Testing

Beginning with Spring 2015 internships, **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.

Required tests:

- Praxis Core Academic Skills for Educators Tests (or qualifying substitute)
- VCLA
- 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

Beginning with spring 2015 internships, verification that the 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.

Background Checks/Fingerprints

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. Students are **strongly advised** to disclose any/all legal incidents that may appear on their records. The consequence of failing to do so, whether or not such incidents resulted in conviction, is termination of the internship.

Please Note: Your G-Number must be clearly noted (visible and legible) on the face of the document(s) that you submit.

Application

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

Deadlines:

Spring internship application:

- Traditional: September 15
- On-the Job: November 1

Fall internship application:

- Traditional: February 15
- On-the Job: May 1