



**THE  
CITADEL**  
THE MILITARY COLLEGE OF SOUTH CAROLINA

**EDUC 546-W1: Leadership and Critical  
Issues in STEM Education**

Fall 2017

*Draft 8-21-17*

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Credit Hours: 3	

**PREREQUISITES:** None

**REQUIRED READING AND VIDEO:** Available on-line. See Weekly assignments below for information and hyperlinks.

Note: If you should encounter a computing issue, The Citadel's Information Technology Service may be able to help. Their web page includes computer recommendations as well as help center contact information:  
<http://www.citadel.edu/root/its>

**SUPPLEMENTARY SUGGESTED READING:** (see recent special issues related to the topics below)

- Association for Supervision and Curriculum Development. available: [www.ascd.org](http://www.ascd.org)
- Buck Institute. Project Based Learning for the 21<sup>st</sup> Century. available: [www.bie.org](http://www.bie.org)
- Buck Institute. 8 Essentials for Project Based Learning. available: [http://www.bie.org/tools/freebies/8\\_essentials\\_for\\_project-based\\_learning](http://www.bie.org/tools/freebies/8_essentials_for_project-based_learning)
- Buck Institute. Project Based Learning Rubric. available: [http://images.bie.org/uploads/useful\\_stuff/BIE\\_PBL\\_School\\_Rubric\\_FINAL.pdf](http://images.bie.org/uploads/useful_stuff/BIE_PBL_School_Rubric_FINAL.pdf)
- International Society for Technology Education (ISTE) National Education Technology Standards (NETS) for Students, Teachers, and Administrators. available: [www.iste.org](http://www.iste.org)
- National Council of Teachers of Mathematics. available: [www.nctm.org](http://www.nctm.org)
- National Science Teachers Association. available: [www.nsta.org](http://www.nsta.org)

**STUDENT INFORMATION:**

This course is designed for STEM Educators. If you should encounter a computing issue, The Citadel's Information Technology Service may be able to help. Their web page includes computer recommendations as well as help center contact information: <http://www.citadel.edu/root/its>

**COURSE DESCRIPTION:**

This course is designed to help candidates consider critical issues linked to successful leadership models in the integration of Science, Technology, Engineering and Mathematics (STEM) into educational endeavors. The on-line instructional approach for this course includes asynchronous discussions; computer based application use and development; as well as curriculum development activities. Throughout the course, participants are expected to also engage in reflective activities from the perspectives of "teacher as learner" and "teacher as instructional leader."

**THE CITADEL'S SCHOOL OF EDUCATION'S CONCEPTUAL BASE**  
*Developing Principled Educational Leaders for P-12 Schools*

The Citadel's Professional Education Unit prepares principled educational leaders to be knowledgeable, reflective, and ethical professionals. Candidates completing our programs are committed to ensuring that all students succeed in a learner-centered environment.

The Citadel's Professional Education Unit is committed to the simultaneous transformation of the preparation of educational leaders and of the places where they work. Specifically, The Citadel's Professional Education Unit seeks to develop principled educational leaders who:

- have mastered their subject matter and are skilled in using it to foster student learning;
- know the self who educates (Parker J. Palmer) and integrate this self-knowledge with content knowledge, knowledge of students, and in the context of becoming professional change agents committed to using this knowledge and skill to ensure that all students succeed in a learner-centered environment; and
- exemplify the highest ethical standards by modeling respect for all human beings and valuing diversity as an essential component of an effective learner-centered environment.

The Citadel's Professional Educational Unit is on the march, transforming itself into a Center of Excellence for the preparation of principled educational leaders. Through our initial programs for teacher candidates for P-12 schools and our advanced programs for professional educators in P-20 schools, The Citadel's Professional Education Unit transforms cadets and graduate students into principled educational leaders capable of and committed to transforming our schools into learning communities where all children and youth succeed.

The Citadel's Professional Education Unit has identified 15 performance indicators for candidates to demonstrate that they are principled educational leaders who are knowledgeable, reflective, and ethical professionals:

**Knowledgeable** Principled Educational Leaders...

1. Have mastered the subject matter of their field of professional study and practice;
2. Utilize the knowledge gained from developmental and learning theories to establish and implement an educational program that is varied, creative, and nurturing;
3. Model instructional and leadership theories of best practice;
4. Integrate appropriate technology to enhance learning;
5. Demonstrate a commitment to lifelong learning;

**Reflective** Principled Educational Leaders...

6. Develop and describe their philosophy of education and reflect upon its impact in the teaching and learning environment;
7. Develop and manage meaningful educational experiences that address the needs of all learners with respect for their individual and cultural experiences;
8. Construct, foster, and maintain a learner-centered environment in which all learners contribute and are actively engaged;
9. Apply their understanding of both context and research to plan, structure, facilitate and monitor effective teaching and learning in the context of continual assessment;
10. Reexamine their practice by reflectively and critically asking questions and seeking answers;

**Ethical** Principled Educational Leaders...

11. Demonstrate commitment to a safe, supportive, learning environment;
12. Embrace and adhere to appropriate professional codes of ethics;
13. Value diversity and exhibit a caring, fair, and respectful attitude and respect toward all cultures;
14. Establish rapport with students, families, colleagues, and communities;
15. Meet obligations on time, dress professionally, and use language appropriately.

## Course Goals with Relationship to the conceptual base:

(Related performance indicators are displayed in parenthesis)

Master of Science in STEM Education candidates who take this course will:

- Compare leadership models utilized in current educational and professional development endeavors (CF1-3)
- Revise their Philosophy of Education to include a plan for implementing STEM into their present and/or future career interests. (CF 5 & 6, 11-14)
- Navigate within the virtual classroom and model appropriate ISTE-S standards.(CF4)
- Survey STEM related work settings to establish local resource and career pathway connections. (CF 5 & 9)
- Create plans linked to the appropriate educational level that model ISTE-NETS-T and S standards as well as
  - meet the needs of learners from differing economic, social, racial, ethnic, and religious backgrounds (CF 2, 7-10, 11-14)
  - address a variety of ways in which students learn (CF 2-5, 6-9, 11, 13-14)
  - incorporate Career Pathways and STEM related community resources (CF 14)

## CLASS EXPECTATIONS

This course is an online course. As you move through the course, you will discover that while there are content similarities, on-line instruction for this course is different from what you would experience in a traditional, face to face course. Please know that while the course is asynchronous in format and you will be working from different locations, interaction within the discussion boards is an essential part of the learning process for this course.

### Class Attendance

Participation in asynchronous class discussions is expected at least twice each week with at least two responses to discussion posts made by others in the course.

### Assignments

In this course, you will have readings and videos to view, discussions to participate in and projects to complete. You will be working on several of these assignments throughout the course. As the course progresses, you will be reminded of the due dates. Please do remember that it will be your responsibility to keep up with the assignments. All assignments are to be turned in on time. Late assignments may not be accepted or will be assigned lower grades. **See Assessment, Assignment Instructions, and Grading Rubrics information that is included below. Contact us if you have concerns or need help completing the work.**

### Implementation of Project Expectation

It is expected that each participant will create a project based on learning something new to them and then find another person or people to teach that new skill to. A reflection about this experience along with documentation is expected in the final discussion board section of CITLearn.

### Disability Disclosure

If you need accommodations because of a disability, please inform us immediately. Please e-mail privately to let us know about your specific needs. If you need additional support as you move through this and other courses, The Citadel maintains an Office of Access Services, Instruction and Support (OASIS) located in room 105 Thompson Hall. To receive additional assistance, email Dr. Jane Warner – jane.warner@citadel.edu or call 953-1820 to set up an appointment. OASIS is responsible for reviewing documentation provided by students requesting academic accommodation and for accommodation in cooperation with students and instructors as needed and consistent with course requirements.



## Honor Statement

Integrity is an expectation. Students of The School of Education at The Citadel are expected to meet the standards set forth in the Citadel Graduate School Catalog: "The Citadel has among its primary purposes teaching, research, and the expansion and dissemination of knowledge. Products of these endeavors include the development and use of intellectual property. It is the policy of the College that its faculty, staff, and students carry out their scholarly work in an open and free atmosphere that encourages publication and creation of such works without constraint but consistent with applicable laws and College policy. This policy will be in accord with the guidelines and criteria published in The American Association of University Professors' 'Statement of Copyright' (Policy Documents and Reports. Ninth Edition, 2001, or subsequent editions)."

## ASSESSMENT

Grades for EDUCATION 546 are based on a variety of assignments.

Specific information about each of these follows the Course Schedule.

The relative weights used for calculating the course grade are as follows:

Assignment	Percent
Discussion Board posts and replies	30%
Needs assessment survey	5%
Needs assessment Parts 1-4 (each 5%)	20%
Philosophy of Leadership	20%
Final Project	25%

90.0-100.0=A, 85.0-89.9=B+, 80.0-84.5=B, 75.0-79.5=C+, 70.0-79.9=C, 0-69.9=F

## Information about Discussion Posting (per The Citadel's On-line Faculty Academy)

**Discussion Answer Postings:** "This category reflects the quality of a student's answers that contribute in a meaningful way to producing a fruitful learning environment for all participants. The criteria for grading answers can vary based upon the nature of the question, but the following are helpful tips to use, as applicable, to particular questions:

1. Ensure that you answer the question(s) being asked, as well as all parts of the question. So, read the question carefully.
2. Explicitly cite relevant concepts.
3. Apply concepts to offer an in-depth explanation, i.e., state why your answer makes sense.
4. Cite examples from real life cases, your experience, or things you've read.
5. Compare and contrast varying views on an issue.

**Discussion Replies:** This category reflects the quality and quantity of a student's Replies to the answers that others have posted. In order to receive any credit, replies must be substantive and relevant to the corresponding answer. Effective replies offer some reflection upon the specific ideas in the answers posted by others. See items 1-5 in Discussion Answer Postings above for ideas when you're unsure how to reply to an answer. No credit will be given for replies that simply state things like the following: I agree, nice job, well done, and the like, i.e., if a particular reply could apply to any answer, anywhere, then it is inadequate. The reply should have information that relates to the particular answer to which it pertains. At least two Replies are required for each Discussion throughout the course, unless otherwise specified."

Everyone must reply in each Discussion, including those who are assigned to answer the question. Discussion Replies are due within one week of each lesson's start date. Discussion Replies should not be submitted late for credit.

**Assessments for other Assignments are in Rubric form and will be included with each assignment in the discussion board.**

### Course Schedule for EDUC 546

WEEK	TOPIC	ASSIGNMENT
Week 1 (8/21-27)	Introduction	1.1 Discussion Board "Introduction – Due Aug. 27"
Week 2 (8/28 – 9/3)	Teachers as Leaders	2.1 – Read "Ten Roles for Teacher Leaders" 2.2 – Discussion Board "Teacher Leaders – Due Sept. 3"
Week 3 (9/4-10)	Assessing Needs	3.1 – Read "Designing Effective School Improvement Strategies" 3.2 – View PPT on Needs Assessment 3.3 – Take ACSD Survey (export PDF to turn in) 3.4 – Discussion Board – "Summarize Needs – Due Sept. 10"
Week 4 (9/11-17)	Designing a Needs Assessment	4.1 – Discussion Board – "Top 3 Needs – Due Sept. 17" 4.2 – Pick 1 article from "Voices in Urban Education" to read 4.3 – Draft of Needs Assessment – Part 1 – Due Sept. 17
Week 5 (9/18-24)	Leadership theories – Part 1 (Contingency theories)	5.1 – Read Chapter 3 5.2 – View PPT on Contingency Theories 5.3 – Discussion Board – "Contingency Theory – Due Sept. 24"
Week 6 (9/25 – 10/1)	Leadership theories – Part 2 (Relational-based model)	6.1 – Read Chapter 6 6.2 – View PPT on Relational-based model 6.3 – Discussion Board – "Relational-based model – Due Oct. 1" 6.4 - Draft of Needs Assessment – Part 2 – Due Oct. 1
Week 7 (10/2-8)	Philosophies of Education – Part 1 (Learner-Focused)	7.1 – Read "Philosophy of Education" 7.2 – Discussion Board "Philosophies-Part1-Due Oct. 8"
Week 8 (10/9-15)	Philosophies of Education – Part 2 (Process-Focused)	8.1 – Discussion Board "Philosophies-Part2-Due Oct. 15" 8.2 - Philosophy of Leadership as a STEM Educator (first draft due 10/8)
Week 9 (10/16-22)	Philosophy of Leadership as a STEM Educator	9.1 – Discussion Board "STEM Leaders – Due Oct. 22" 9.2 - Draft of Needs Assessment – Part 3 – Due Oct. 22
Week 10 (10/23-29)	Addressing critical issues	10.1 – Read "The Challenges of STEM Education" 10.2 – Read "The Problem (and possible solution) of STEM Education" 10.3 – Discussion Board "Critical issues – Due Oct. 29"
Week 11 (10/30 – 11/5)	Critical thinking – Part 1	11.1 – Read "The Practice of Critical Discourse in Science Classrooms" 11.2 – Read "Inductive & Deductive Science Thinking" 11.3 – Discussion Board "Science Thinking – Due Nov. 5"
Week 12 (11/6-12)	Critical thinking – Part 2	12.1 – Read "Evaluate the Strength of Evidence in Scientific Arguments" 12.2 – Read "The Argumentation and Evaluation Guide" 12.3 – Discussion Board "Argumentation – Due Nov. 12"
Week 13 (11/13-19)	Creativity and STEM	13.1 – Read "Full STEAM Ahead" 13.2 – Read "Understanding STEM Education and Supporting Students through Universal Design for Learning" 13.2 – Discussion Board "Creativity – Due Nov. 19"
BREAK (11/20-26)		
Week 15 (11/27 – 12/4)		15.1 - FINAL PROJECT DUE (12/4) – Develop a lesson plan that explicitly exemplifies at least one philosophy of education, at least one critical thinking strategy, and creativity

#### Rubric for Blog posts and Discussion Forum Posts

CATEGORY	Meets Standards 2 pts	Approaching Standards 1 pts	Not Acceptable 0 pts
<b>Information</b>	The entry demonstrates that the participant learned something new from the talk.	The entry includes basic information	There are no specific descriptions.

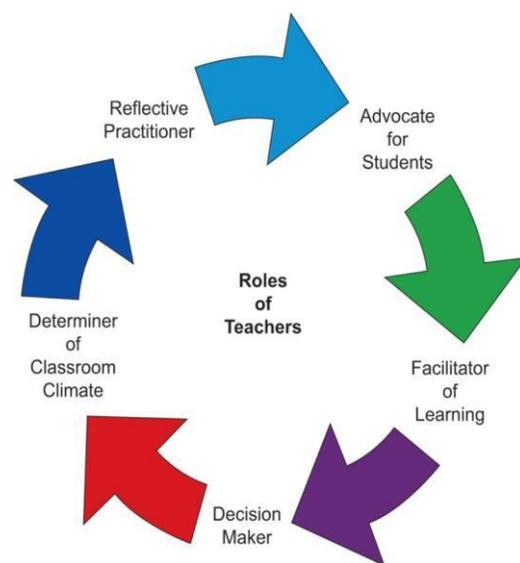
<b>Personal Application Position</b>	A specific position with personal applications is included.	A position is included but includes no personal applications.	No personal application is included
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Rubric modified by Dr. Kathryn Richardson Jones

## Philosophy of Leadership as a STEM Educator Assignment

This is an ongoing assignment for the rest of the course. This assignment is parallel to creating a personal Philosophy of Education. As you move forward in your professional career, you will need to decide more about how you will serve as an educational leader. **This assignment is due at the end of the semester and should be uploaded in the "Final" tab.**

In a recent textbook, Dr. Sara Davis Powell described the roles of teachers as one of a continuous cycle as shown to the right.



- For your Philosophy of Leadership in Education, make a list of how you accomplish each of these roles and how you will do this as a STEM Educator. This can be in the form of a bulleted "T – Chart."
- Once you have done that, look at the "Philosophies of Comparison" created by LeoNora Cohen and found on the next page.
  - Which world philosophy (or philosophies) most closely matches your narrative?
  - What will be your curricular emphasis and how will you focus instruction?
  - What methods will you use to teach?
  - How will you assist with character development?
  - How will you support the efforts of other educators in your work setting?

### Philosophy Assignment

CATEGORY	5	3	0
<b>Roles of Educators</b>	Entries for <b>each</b> of the roles as a teacher is included with a comparison with leadership	Entries for <b>most</b> of the roles as a teacher is included with a comparison with leadership	Content is confusing.
<b>Comparison of Personal Philosophy to Common World Views</b>	The comparison portion of the paper includes concise answers to each of the questions.	The comparison portion of the paper includes answers to the questions but is somewhat vague.	Not included or the content is confusing.
<b>Sequencing of Information</b>	Information is organized in a clear, logical way.	Some information is logically sequenced. An occasional item of information seems out of place.	There is no clear plan for the organization of information.
<b>Effectiveness</b>	The Leadership Philosophy could be used as part of a letter of introduction or as a way to help others understand this person's leadership approach	The Philosophy needs to be improved in 3 to 5 ways.	This narrative would not be helpful as part of a letter of introduction or way to help others understand this person's leadership.

Rubistar ® Assessment Rubric modified by Dr. Kathryn Richardson Jones.

## Philosophies Comparison

Modernity <-----> Post Modernity  
 Traditional and Conservative <-----> Contemporary and Liberal  
 Authoritarian (convergent) <-----> (divergent) Non-Authoritarian

<b>General or World Philosophies</b>	<b>Idealism:</b> Ideas are the only true reality, the only thing worth knowing. Focus: <i>Mind</i>	<b>Realism:</b> Reality exists independent of human mind. World of physical objects ultimate reality. Focus: <i>Body</i>		<b>Pragmatism:</b> Universe is dynamic, evolving. Purpose of thought is action. Truth is relative. Focus: <i>Experience</i>	<b>Existentialism:</b> Reality is subjective, within the individual. Individual rather than external standards. Focus: <i>Freedom</i>
Originator(s)	Plato, Socrates	Aristotle		Pierce, Dewey	Sartre, Kierkegaard
Curricular Emphasis	Subject matter of mind: literature, history, philosophy, religion	Subject matter of physical world: science, math		Subject matter of social experience. Creation of new social order	Subject matter of personal choice
Teaching Method	Teach for handling ideas: lecture, discussion	Teach for mastery of facts and basic skills: demonstration, recitation		Problem solving: Project method	Individual as entity within social context
Character Development	Imitating examples, heroes	Training in rules of conduct		Making group decisions in light of consequences	Individual responsibility for decisions and preferences
<b>Related Educational Philosophies</b>	<b>Perennialism:</b> Focus: Teach ideas that are everlasting. Seek enduring truths which are constant, not changing, through great literature, art, philosophy, religion.	<b>Essentialism:</b> Focus: Teach the common core, "the basics" of information and skills (cultural heritage) needed for citizenship. (Curriculum can change slowly)		<b>Progressivism:</b> Focus: Ideas should be tested by active experimentation. Learning rooted in questions of learners in interaction with others. Experience and student centered.	<b>Reconstructionism/ Critical Theory</b> Focus: Critical pedagogy: Analysis of world events, controversial issues and diversity to provide vision for better world and social change.
<b>Key Proponents</b>	Robert Hutchins, Jacques Maritain, Mortimer Adler, Allan Bloom	William Bagley; Arthur Bestor, E. D. Hirsch, Chester Finn, Diane Ravitch, TheodoreSizer		John Dewey, William Kilpatrick	George Counts, J. Habermas, Ivan Illich, Henry Giroux, Paulo Freire
<b>Related Theories of Learning (Psychological Orientations)</b>	<b>Information Processing</b> The mind makes meaning through symbol-processing structures of a fixed body of knowledge. Describes how information is received, processed, stored, and retrieved from the mind.	<b>Behaviorism</b> Behavior shaped by design and determined by forces in environment. Learning occurs as result of reinforcing responses to stimuli. <b>Social Learning</b> Learning by observing and imitating others.		<b>Cognitivism/ Constructivism</b> Learner actively constructs own understandings of reality through interaction with environment and reflection on actions. Student-centered learning around conflicts to present knowing structures.	<b>Humanism</b> Personal freedom, choice, responsibility. Achievement motivation towards highest levels. Control of own destiny. Child centered. Interaction with others.
<b>Key proponents</b>	R. M. Gagne, E. Gagne, Robert Sternberg, J.R. Anderson	Ivan Pavlov, John Watson, B.F. Skinner, E.L. Thorndike, Albert Bandura		Jean Piaget, U. Bronfenbrenner, Jerome Bruner, Lev Vygotsky	J.J. Rousseau, A. Maslow, C. Rogers, A. Combs, R. May

Source: LeoNora Cohen (1999)