



MEd in Interdisciplinary STEM Education EDUC 547: Research and Statistics for STEM Applications	
Instructor: Jennifer Albert, Ph.D.	Class Meetings: Asynchronous
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Email: jalbert@citadel.edu	Credit Hours: 3

Course Description

This is a three (3) unit graduate course for teachers in STEM education with no previous background in statistics who will need statistics in their further studies and their work. The focus is on understanding the use of research and statistical methods in various areas of science and engineering. Topics to be covered include research methods, measures of central tendency and variability, correlation, statistical inference, and basic design of experiments with examples and applications in science and engineering. Teachers will become critical consumers of research products and learn the basic skills of planning, designing, and executing and reporting research as well as evaluating and applying published research findings. Emphasis will concentrate on planning, developing, and producing a quality STEM research e- portfolio.

Required Course Management and Portfolio Systems

The Citadel's course management system, CitLearn (<http://citadel.blackboard.com>), will be used for all class activities, except the e-portfolio.

The School of Education's e-portfolio system, LiveText (www.livetext.com), will be used to create the STEM research e- portfolio.

Required Textbook

Hendricks, C. (2013). *Improving schools through action research: A comprehensive guide for educators* (3rd ed.). Boston, MA: Allyn and Bacon. The textbook is available as an e-book from the Citadel Bookstore (<http://thecitadel.bncollege.com/>).

Required Style Manual

Scholarly research in education requires the effective communication of findings and evaluation of the writings of others. An important aspect of this scholarly communication is demonstrating your understanding and facility with standard educational citation formatting. Further, when you report your research findings to an audience, you must use care that information that you have cited will be available to your reader. A style manual ensures that you have provided all the information necessary for your reader. For the School of Education, the established style manual will be the APA manual.

American Psychological Association. (2009). *Publication manual of the American Psychological Association* (6th ed.). Washington, DC: APA.

Course Goals

Upon completion of the course, students should be able to:

- Understand the role of research in educational learning environments
- Apply and evaluate quantitative, qualitative, and action research methods

- Analyze the strengths and limitations of educational research

- Apply rigorous thinking and analytical methods to the solutions of educational problems
- Create an electronic portfolio to present an action research study report

Course Schedule: The schedule represents an overview of the topics that will be covered. The schedule is subject to change based on class needs.

Dates	Topic	Activities/Assignments
Unit 1 8/22 – 9/2	- Getting to Know Your Classmates - Course Overview, CitLearn Basics	Due: Introduction Blog-Part 1 (8/23) Due: Introduction Blog-Part 2 (8/26) Due: Research Competency Pretest (8/30)
Unit 2 9/5 – 9/16	- Research Methods in Education - Generating Research Ideas Through Reflection - Initial Planning of the Action Research Study	<i>Readings:</i> Hendricks, Chapters 1, 2 & 4 Due: Discussion Board Activity (9/9) Due: Action Research Plan (9/16) Due: LiveText Portfolio Creation (9/16)
Unit 3 9/19 – 9/30	- Connecting Theory & Action: Reviewing the Literature Review - Protecting Human Subjects	<i>Readings:</i> Hendricks, Chapter 3 Due: Discussion Board Activity (9/23) Due: Protecting Human Subjects Certification (9/23)
Unit 4 10/3 – 10/14	- Strategies for Collecting Data - Final Planning Before Implementation of the Study	<i>Readings:</i> Hendricks, Chapters 5 & 6 Due: Discussion Board Activity (10/7) Due: Citadel's IRB Application (10/14) Due: Action Research Project, Part 1 (10/21)
Unit 5 10/17 – 10/28	- Strategies for Data Analysis	<i>Readings:</i> Hendricks, Chapter 7 Due: Discussion Board Activity (10/21) Due: Data Analysis Assignment (10/28)
Unit 6 10/31 – 11/11	- Strategies for Data Analysis, continued - Writing Methods and Results	Due: Action Research Project, Part 2 (11/11)
Unit 7 11/14 – 11/25	- Group Work Fall Break, No Classes (11/21 – 11/25)	
Unit 8 11/28 – 12/5	Final Projects	Due: Final Action Research Report (11/30) Due: Peer Evaluations (12/5) Due: Action Research Reflection Paper (12/5) Due: Research Competency Posttest (12/5)

Assessments

Grades for EDUC 547 are based on a variety of assignments. The relative weights used for calculating the final course grade are as follow:

Assignment	Possible Points	Percent of Final Grade
Introduction Exercise	5	5%
Institutional Review Board (IRB) Certification	5	5%
Citadel IRB Application	5	5%
Discussion Board Activities	20	20%
Data Analysis Assignment	10	10%

Action Research Study Assignments 1. Report (40 pts) 2. Peer Evaluations (5 pts)	45	45%
Action Research Reflection Paper	10	10%
Research Competency Pretest & Posttest	--	--
Total	100	100%

Introduction Exercise: Students are required to post educational and professional information to the discussion board and discuss research interests.

Institutional Review Board Certification: Students will complete the National Institute of Health's IRB Computer-Based Training Course. The course is located at <http://phrp.nihtraining.com> and will take approximately 2-3 hours to complete. Students will receive a certificate upon completion of the course.

Citadel's Institutional Review Board Application: Students will complete the Citadel's application for conducting research using human subjects. The application must be approved before data can be collected. Students will receive an approval letter from the School of Education's representative on the Citadel's IRB Committee.

Discussion Board Activities: Students will be given the opportunity to demonstrate comprehension, knowledge, and application of research methods and concepts. The first week of each module will require students to respond to a prompt. The second week, students must post reflections for at least 3 other student responses.

Data Analysis Assignment: Students will be given the opportunity to demonstrate comprehension, knowledge, and application of statistical concepts.

Action Research Study Report, Drafts, & Peer Evaluations: Students will perform the following activities: (1) select a topic, (2) conduct a review of the literature related to the topic, (3) collect data related to the topic (interview, observation, or survey) from a local school, (4) analyze data, and (5) create a LiveText portfolio. The drafts give students the opportunity to present sections of the action research study report for review and feedback. Students will have an opportunity to evaluate an action research study portfolio.

Action Research Reflection Paper: Students describe the following: (1) how reflection can be used to generate ideas for action research; (2) the process of reflective and reflexive inquiry throughout the action research process; and (3) ways in which the action research studies align with professional goals.

Research Competency Pretest & Posttest: The Research Competency Pretest and Posttest is designed to assess students' knowledge, skills, and abilities prior to enrolling in and after completing a research course in the School of Education. All students enrolled in School of Education Programs are required to take the test.

Class Participation/Dispositions: Students will be required to participate in class discussions which consist of individual and group activities. Students are required to exhibit appropriate behavior for online learning (e.g., posting work on time and respecting the opinions of classmates). Appropriate dispositions are requirements for all graduate students enrolled in School of Education programs; as such, points are not awarded. However, points may be deducted from the final course grade lack of class participation and inappropriate classroom dispositions.

Grades

The grading scale used is: A (90-100), B+ (85-85.9), B (80-84.9), C+ (75-79.9), C (70-74.9), and F (< 69.9).

Preparation

Students are expected to read and study the course textbook(s) and all additional readings as assigned. All material submitted for evaluation must be the original, creative works of the student whose name appears on the document.

Students are expected to remain knowledgeable at all times of The Citadel's academic dishonesty policy as explained in the graduate catalog.

Submission

Students are expected to complete all examinations, course assignments and requirements, and to complete them on time. Assignment submitted after specified due date and time, without the permission of the instructor, will have its total score reduced by 5% for each day that it is late. Any assignment submitted MORE THAN ONE WEEK after the deadline will not be accepted for grading, and a failing grade will be recorded; that is, unless a student has received an extension from the instructor. This is only fair to students who submit their assignments on time.

Incomplete Grade

A grade of *Incomplete* (I) will be assigned only in those rare instances when course requirements have been very nearly met, but for authorized reasons (illness, injuries, family emergency, etc.) cannot be completed by the end of the semester. To be eligible for an I, a student's work must be satisfactory at the time he/she is forced to terminate participation in the course. Unsatisfactory work in a course should result in the failing grade of F. It is the student's responsibility to present the *authorized reason* for failing to complete all course requirements. When this reason has not been presented or when the reason presented does not meet the requirements of the instructor, the final grade will reflect the grade of zero on all missing work.

Disability Disclosure Statement

If you need accommodations because of a disability, please inform me immediately. Please see me privately, either after class or in my office. To initiate accommodation, students must register with the Office of Access Services, Instruction and Support (OASIS) located in room 105 Thompson Hall or call 953-1820 to set up an appointment. This office 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

As a professional educator, integrity is an expectation. Students of The School of Education at The Citadel are expected to meet the standards set forth in the Citadel Code. Available at:

<http://citadel.edu/r3/honor/manual.shtml>.

Cheating and plagiarism violations will be reported and a failing grade will be assigned for the work in question. This class will follow The Citadel Honor Manual regarding plagiarism.

- Plagiarism is the act of using someone else's words or ideas as our own without giving proper credit to the sources.
- When you quote another's words exactly you *must* use quotation marks and a footnote (or an indication in your paragraph) to tell exactly where the words came from, down to the page number(s). When you mix another's words and ideas with your own in one or more sentences, partially quoting the source exactly and partially substituting your own words, you must put quotation marks around the words you quote and not around your own. Then you cite the source, down to the page number(s).
- When you paraphrase another's words or ideas, that is, when you substitute your words for another's words, but keep their idea(s), you do not use quotation marks, but you must cite the source, down to the page number(s).
- When you use only another's idea(s), knowing that they are the other's ideas, you must cite the source of that idea or those ideas, down to the page number(s).
- Citing the source means giving, as a minimum, the author, the title of the book, and the page number.

Writing Formal (APA) Papers

Students may encounter problems with writing collegiate-level papers and theses. Should the professor deem that the student's work does not meet minimum program requirements; the student will be required to seek the services of The Academic Support Center at the Citadel. The Academic Support Center has as its primary focus the enhancement of writing skills in the Citadel community. All students identified encountering writing problems are eligible to attend individual tutorials and group workshops. Because of the interdependence of writing, reading, and study skills; the Academic Support Center has parallel but subsidiary responsibilities to assist students in the development of reading comprehension and learning strategies. To schedule an appointment, go to Room 117 Thompson Hall, call 953-5305, or email ascenter@citadel.edu.