

Research Methods in Physics Education

The point of this class is to help you develop as researchers in physics education. There are three interrelated goals:

- Research study design
- Broad review of research papers
- Professional development as researchers

The course activities connect to these broad goals in several ways.

- You will learn how to match research questions, methodologies, and theoretical frameworks.
- You will practice designing studies with various practical constraints (access to populations, kinds of equipment, duration of study, etc).
- You will engage with the messy process of analyzing real data.
- You will examine the research literature in PER and related fields to learn how other people solve these problems.
- You will produce documents that will be useful in your future professional lives: a research statement, a proceedings paper, and an NSF-style proposal.

Collaboration and help

Physics is a collaborative field. I expect that you will work with your peers in group work during class and on written homework. Every member of every group is responsible for all of the intellectual work of this class; “floaters” will find that they do poorly. In all work, you must cite your sources (including group mates, if applicable) appropriately. An appropriate citation will have enough information in it that I can look it up myself, or in the case of live people, ask them myself. When you use citations in your proceedings paper, you should use the format of the journal. When you use citations in your NSF proposal, you may use whatever NSF-approved format you like.

Because of the cumulative nature and quick pace of this class, you should seek help early and often if you are having difficulty. When in trouble or in doubt, send me an email or stop by my office (CW 329).

Office hours

Generally, I am in my office 12:45-6 Tuesdays and Thursdays, all day Wednesdays, and occasional other times unless I have an appointment that takes me elsewhere. You can see my schedule at <http://www.zaposa.com/schedule>. You may stop by my office at any time; if the door is open and there's no one else here, I am available to chat with you. If you would like to ensure that I am available, you can check my schedule and email me a time you'd like to stop by. I have set aside the period immediately after class on Tuesdays as a time that I am very likely to be in my office; however, I encourage you to just stop by.

Grading

Participation (34%) You will participate fully in class every day. To help you participate, you will write article summaries, respond to the summaries of your classmates, prepare study designs, and otherwise contribute to the work of the course.

Proceedings paper (33%) You will prepare a paper in the style of the PERC or AERA proceedings. This grade includes both your paper and the related work which precedes it: research statement, lit review, data analysis, claims, revisions, etc.

NSF proposal (33%) You will prepare an abbreviated NSF-style proposal and participate in peer-review. Your proposal will include a summary, project description, references, and a budget.

Due dates and other logistics

The authoritative class schedule is available on my website, www.zaposa.com/schedule (look for light brown colored due dates at the top of the schedule window.). Readings and other assignments are posted on the day on which they are due. To see details, you can click on the assignment name.

I do not like to have extra dead-tree paper floating around, waiting to get lost. To support this broad idea, the following policies are in place for this class:

- Reading summaries must be posted on the discussion board on KSOL in accordance with the directions on the sticky note at the top of the forum. Responses to your classmates' summaries must also be posted in accordance with those directions.
- For all other writing assignments (except the reading summaries), you should upload a pdf of your work to the appropriate folder on KSOL. They are all due before the start of class on their listed due date. If you choose to make slides for a presentation, you should upload PDFs of your slides.
- I will respond to your written work electronically or verbally; I do not plan to print.
- Papers are distributed via Mendeley and, occasionally, KSOL. You must be my Mendeley friend to join the group. Mendeley is a free platform for bibliographic management. If you don't want to be my friend, you will need to find the papers on your own time; citations to these papers are listed in the course calendar.
- If you want to take notes on paper, feel free! You can also take notes on your tablet. Please don't hide behind a computer screen during class. On occasion, you may find it useful to take a picture of the board with your phone.

Late Work

Generally speaking, I don't accept late work. It will be more difficult for you to keep up in class if you fall into a pattern of late work. It's also more difficult for me to grade it fairly and return

it promptly. For those reasons, I am extremely unlikely to accept late work if the reason for its tardiness could have been prevented with better time management skills on your part.

If you would like to turn in your work late and receive credit on it, you must tell me why you would like an extension *and* propose a new deadline for the work to be turned in. You must do this in writing (email or paper). I will evaluate your reason and decide to grant your request (or not). If you think you might want an extension, I strongly encourage you to discuss it with me ahead of time. If your reason is insufficient and your work is already late, there is no recourse. *Unexcused late work will not be graded, and you will receive a zero on it.*

Under no circumstances will work be accepted later than when I have already turned back others' work. Under extraordinary circumstances, it may be exempted (which means you don't have to turn it in, and it has no effect on your grade – your other assignments will be worth more).

Attendance

Generally speaking, you can't do in-class work, hand in homework, or participate in discussions if you're not in class. This is a discussion-based course, and skipping class will make it more difficult to succeed. If you are planning to miss class (or if you have already missed class), you should send me an email with *when* and *why* you will miss class, and your proposed deadlines for the work that you will miss. Whatever your reasons for missing class are, you are still responsible for all of the material covered and announcements made during class.

If you are going on a University-sponsored trip and will miss class, you should email me ahead of time to make alternate arrangements for the work you will miss. If you are sick, it is likely that your in-class work will be exempted, but your homework will not. *Do not come to class if you are contagious!* You are all adults, and I trust that you will make mature and intelligent decisions about when to come to class, and accept the consequences of your choices gracefully and respectfully.

Legalese

Kansas State University has an Honor System based on personal integrity, which is presumed to be sufficient assurance that, in academic matters, one's work is performed honestly and without unauthorized assistance. Undergraduate and graduate students, by registration, acknowledge the jurisdiction of the Honor System. The policies and procedures of the Honor System apply to all full and part-time students enrolled in undergraduate and graduate courses on-campus, off-campus, and via distance learning. The honor system website can be reached via the following URL: www.k-state.edu/honor. A component vital to the Honor System is the inclusion of the Honor Pledge which applies to all assignments, examinations, or other course work undertaken by students. The Honor Pledge is implied, whether or not it is stated: "On my honor, as a student, I have neither given nor received unauthorized aid on this academic work." A grade of XF can result from a breach of academic honesty. The F indicates failure in the course; the X indicates the reason is an Honor Pledge violation.

Students with disabilities who need classroom accommodations, access to technology, or information about emergency building/campus evacuation processes should contact the Student Access Center and/or their instructor. Services are available to students with a wide range of disabilities

including, but not limited to, physical disabilities, medical conditions, learning disabilities, attention deficit disorder, depression, and anxiety. If you are a student enrolled in campus/online courses through the Manhattan or Olathe campuses, contact the Student Access Center at accesscenter@k-state.edu, 785-532-6441; for Salina campus, contact the Academic and Career Advising Center at acac@k-state.edu, 785-826-2649.

All student activities in the University, including this course, are governed by the Student Judicial Conduct Code as outlined in the Student Governing Association By Laws, Article V, Section 3, number 2. Students who engage in behavior that disrupts the learning environment may be asked to leave the class.