

# SPRING 2020

## Research Methods in Exercise Science

Kinesiology and Applied Physiology graduate program  
Course # 16:572:505; 3 credits

Instructor: Jennifer Buckman, PhD  
Office: Smithers 225B  
Office Hours: *Monday 12:00pm – 2:00pm*  
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**T & F 10:20am – 11:40am**  
**SMITHERS 219; BUSCH**

### GENERAL COURSE DESCRIPTION

Science careers require a “thick skin” and a lot of grit. More often than most trainees first realize, studies don’t work, grants aren’t funded, and papers are rejected. A key factor to reducing these failures is clear and organized thinking and communication. The overarching goal of this workshop-style course is to improve the chances of success by sharpening written and oral communication skills. The course will emphasize brainstorming, writing, critiquing, and editing. Students will learn to balance scientific writing (clear, concise, and precise) with the art of storytelling (to demonstrate significance and innovation), and learning to write to your audience. Students will be required to write and share a variety of documents; the class will publicly, but professionally critique them. The course will be dynamic and adaptive based on the interests, skills, and weaknesses of the students.

### COURSE OBJECTIVES

Upon completing this course, each student will be able to:

1. Construct well-written scientific arguments for manuscripts, grants, and other scientific formats.
2. Deliver and receive critiques of scientific logic and written expression in a professional manner.
3. Interpret critiques, respond to critiques, and edit to address critiques (even when they seem wrong).
4. Characterize the fundamentals of manuscript and grant submissions.

### COURSE ELEMENTS & GRADING

#### Required Books and Materials

There is no textbook for this course. Readings will be provided weekly. All readings are mandatory.

#### Assignments

Your course grade will be determined by completion of the weekly assignments. Points per assignment are listed in the Course Calendar Outline. **Late assignments will not be discussed and will earn 0 points.**

GRADING RUBRIC: 5 points=Excellent; 4 points=Very good; 3 points= Average; 2 points=Below Average; 1 point=Poor.

**Extra Credit:** There are NO opportunities for extra credit.

<u>Final Grade</u>	<u>Percentage</u>
4.0 (A)	90% or greater
3.5 (B+)	85 - 89.9%
3.0 (B)	80 - 84.9%
2.5 (C+)	75 - 79.9%
2.0 (C)	70 - 74.9%
1.0 (D)	60 - 69.9%
0.0 (F)	0 - 59.9%

## COURSE OUTLINE

Topic 1: Welcome. Introductions. Expectations. Plotting our course.

[ASSIGNMENT 1 \(5 points\)](#) – Find and email 3 articles that you think are interesting but not directly tied to your dissertation/ongoing research. These should be articles that you have NOT read yet. We will use them to identify examples of good and bad writing.

Topic 2: Fundamental of writing, scientific writing, and conveying your thoughts on paper

The class will start with a review of sentence structure and paragraph construction and differences between creative writing and scientific writing. We will learn techniques to refine and edit writing.

[ASSIGNMENT 2 \(10 points – content + writing\)](#) – Write a letter of recommendation for a real or imagined undergraduate student who wants to go to graduate school. You believe that this student will do well in the program to which they are applying.

Topic 3: Journal Articles: Read, critique.

The class will read and critique a variety of published articles. What does good writing look like? How easy is it to follow the logic? How strong were the findings and did the discussion under or overstate them? If you were reviewing the article, what would you write?

[ASSIGNMENT 3 \(10 points – content + writing\)](#) – Read article and write a critique.

Topic 4: Journal Articles. Write, edit.

It's easy to be a critic, but hard to be critiqued. It is also good medicine to remind ourselves how hard it can be to write clearly and concisely for a broad audience. We will work on writing by trying and trying again. The class will construct the logic and arguments for an introduction, then write and edit together.

[ASSIGNMENT 4 \(10 points – content + writing\)](#) – Write an introduction for editing in class.

Topic 5: Journal Articles: Now you.

We will read and critique each other's writing, learning how to clearly & professionally provide criticism, and how to understand and professionally respond. Often times, there is little more than 'a direction' that is saved from a first draft.... Be prepared.

[ASSIGNMENT 5 \(10 points – content + writing\)](#) – Submit a revised introduction that responds to class critiques.

Topic 6: Journal Articles: ...and that's not all.

Authorships, journal selections, editorial boards. Available scientific search engines and reference managers will be reviewed as will best practices for citing supporting literature.

[ASSIGNMENT 6 \(5 points\)](#) – Work with your undergraduate students on their projects.

Topic 7: Grant writing: From the "big" idea to the fundable project.

All research studies must start with a testable idea. To be fundable, these ideas must be testable, quantifiable, and understandable! The class will learn how to shape a scientific question to be answerable, decide what to hypothesize, and how to create the experiment to test the hypothesis.

[ASSIGNMENT 7 \(5 points\)](#) – Present your 'big idea' for a research grant.

Topic 8: Grant writing: Funding considerations.

Before you write your million-dollar masterpiece, there are some things to consider. Who will fund you? How much should you ask for, and how do you determine such things? Grant applications are much, much more than a good idea. Let's dig into the minutia about grant funders, grant reviewers, and .... what happens if you actually get a grant.

[ASSIGNMENT 8 \(5 points\)](#) – Find a call for proposals that you can tailor your grant idea to.

Topic 9: Specific Aims.

The class will start a deep dive into the Specific Aims page, arguably the most important page of a grant application. The class

will learn the fundamentals of writing aims, and differentiate aims from abstracts. The Aims and Abstracts from the several applications will be compared and the class will identify the critical differences. The discussion will include aspects of writing a strong abstract and creating a brief public health narrative.

[ASSIGNMENT 9 \(10 points – content + professionalism\) – Provide undergraduate honors students with analysis help.](#)

Topic 10: Your best self.

The NIH biosketch is designed to move away from the ‘numbers’ and towards contributions. The class will discuss what does and does not belong in the personal statement section and how to structure the scientific contributions sections of the application. The value of service, professional experience, and collaborations will be highlighted. The class will also discuss developing the Candidate Sections in F and K series grants.

[ASSIGNMENT 10 \(10 points – content + writing\) – Complete your biosketch](#)

Topic 11: NIH Research Strategy.

Significance, Innovation, and Approach. What is “premise” and rigor? Why should it be done, and why should you be the person who does it? There is a lot to unpack in these three sections. We will read successful and unsuccessful applications and try to determine if we can spot their ‘hooks’ and ‘fatal flaws’.

[ASSIGNMENT 11 \(10 points – content + writing\) – Find an abstract that is relevant to your research on NIH RePORTER. What are the similarities and differences between your idea and their project? Who funded the project – for how much and how long?](#)

Topic 12: The Review.

To understand what makes a successful grant, an understanding of how grants are reviewed is necessary. The review process will be discussed and the class will learn the rubric used by review groups for scoring applications. Examples of summary statements will be reviewed.

[ASSIGNMENT 12 \(10 points – content + writing\) – Complete an NIH review.](#)

Topic 13: Non-science, non-scored, and other miscellaneous sections.

The majority of time researchers spend on grant applications focuses the Research Plan, but there are many other sections and forms that are needed before a grant is ready for submission. The class will round out the semester with a discussion of the “other” sections of a grant, such as human subjects, inclusion of women and minorities, inclusion of children, Resources and Environment, Equipment, Resource Sharing, Letters of Support, Enrollment Table.

## GENERAL INFORMATION

**Academic Honor Code:** As an academic community dedicated to the creation, dissemination, and application of knowledge, Rutgers University is committed to fostering an intellectual and ethical environment based on the principles of academic integrity. Academic integrity is essential to the success of the University's educational and research missions, and violations of academic integrity constitute serious offenses against the entire academic community. This academic integrity policy is designed to guide students as they prepare assignments, take examinations, and perform the work necessary to complete their degree requirements. The full honor code can be viewed at <http://academicintegrity.rutgers.edu/academic-integrity-policy/>.

### **Cheating and Plagiarism**

Cheating on tests or plagiarizing materials in your papers deprives you of the educational benefits of preparing these materials appropriately. It is personally dishonest to cheat on a test or to hand in a paper based on unacknowledged words or ideas that someone else originated. It is also unfair, since it gives you an undeserved advantage over your fellow students who are graded on the basis of their own work. In this class we will take cheating very seriously. All suspected cases of cheating and plagiarism will be automatically referred to the Office of Judicial Affairs, and we will recommend penalties appropriate to the gravity of the infraction. The university's policy on Academic Integrity is available at <http://academicintegrity.rutgers.edu/academic-integrity-policy>. I strongly advise you to familiarize yourself with this document, both for this class and for your other classes and future work. To help protect you, and future students, from plagiarism, we require all papers to be submitted through Turnitin.com.

According to Rutgers' policy "Plagiarism is the use of another person's words, ideas, or results without giving that person appropriate credit. To avoid plagiarism, every direct quotation must be identified by quotation marks or appropriate indentation and both direct quotation and paraphrasing must be cited properly according to the accepted format for the particular discipline or as required by the instructor in a course. Some common examples of plagiarism are:

- Copying word for word (i.e. quoting directly) from an oral, printed, or electronic source without proper attribution.
- Paraphrasing without proper attribution, i.e., presenting in one's own words another person's written words or ideas as if they were one's own.
- Submitting a purchased or downloaded term paper or other materials to satisfy a course requirement.
- Incorporating into one's work graphs, drawings, photographs, diagrams, tables, spreadsheets, computer programs, or other nontextual material from other sources without proper attribution."

A SPECIAL NOTE: Students often assume that because information is available on the Web it is public information, does not need to be formally referenced, and can be used without attribution. This is a mistake. All information and ideas that you derive from other sources, whether written, spoken, or electronic, must be attributed to their original source. Such sources include not just written or electronic materials, but people with whom you may discuss your ideas, such as your roommate, friends, or family members. They deserve credit for their contributions too!

### **American with Disability Act Compliance:**

In accordance with the ADA, reasonable accommodations will be made for students with documented special needs. Students who require special assistance or accommodations must follow the procedures outlined at <https://ods.rutgers.edu/students/registration-form>. Full disability policies and procedures are available at <https://ods.rutgers.edu>.

### **Disability Services - <https://ods.rutgers.edu/>**

(848) 445-6800 / Lucy Stone Hall, Suite A145, Livingston Campus, 54 Joyce Kilmer Avenue, Piscataway, NJ 08854 / Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student with a disability must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation:

<https://ods.rutgers.edu/students/documentation-guidelines>. If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with a Letter of Accommodations. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. To begin this process, please complete the Registration form on the ODS web site at: <https://ods.rutgers.edu/students/registration-form>.

### **Student-Wellness Services:**

**Just In Case Web App** (<http://codu.co/cee05e>)

Access helpful mental health information and resources for yourself or a friend in a mental health crisis on your smartphone or tablet and easily contact CAPS or RUPD.

**Counseling, ADAP & Psychiatric Services (CAPS) - [www.rhscaps.rutgers.edu/](http://www.rhscaps.rutgers.edu/)**

**(848) 932-7884 / 17 Senior Street, New Brunswick, NJ 08901**

CAPS is a University mental health support service that includes counseling, alcohol and other drug assistance, and psychiatric services staffed by a team of professional within Rutgers Health services to support students' efforts to succeed at Rutgers University. CAPS offers a variety of services that include: individual therapy, group therapy and workshops, crisis intervention, referral to specialists in the community and consultation and collaboration with campus partners.

**Violence Prevention & Victim Assistance (VPVA) - [www.vpva.rutgers.edu/](http://www.vpva.rutgers.edu/)**

**(848) 932-1181 / 3 Bartlett Street, New Brunswick, NJ 08901**

The Office for Violence Prevention and Victim Assistance provides confidential crisis intervention, counseling and advocacy for victims of sexual and relationship violence and stalking to students, staff and faculty. To reach staff during office hours when the university is open or to reach an advocate after hours, call 848-932-1181.

**Scarlet Listeners - <http://www.scarletlisteners.com/>**

**(732) 247-5555**

Free and confidential peer counseling and referral hotline, providing a comforting and supportive safe space.