Research Methods

UF Department of Applied Physiology and Kinesiology
College of Health and Human Performance
UNIVERSITY of FLORIDA

APK 4050| Class # 10412| 3 Credits | Spring 2026

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Course Info

INSTRUCTOR

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Preferred Method of Contact: Email

OFFICE HOURS

Thursdays: 4:00 – 6:00 PM
Virtual meetings scheduled separately
Teaching Assistants are available via email as well as GroupMe

MEETING TIME/LOCATION

Monday – Friday 4:05 – 4:55 PM; FLG 270
Access course syllabus, journal guidelines, and unofficial grades on Canvas (UF e-learning: https://elearning.ufl.edu/) and the Canvas mobile app by Instructure

COURSE DESCRIPTION

Research Methods (RM) examines basic science concepts and techniques used in applied physiology and kinesiology. Students will demonstrate their knowledge of the course materials by analyzing, interpreting, and summarizing research, reviewing refereed articles, and planning research studies.

PREREQUISITE KNOWLEDGE AND SKILLS

APK major with 3, 4, 6, or 7 classifications

REQUIRED AND RECOMMENDED MATERIALS

1. **Strunk, W., & White, E. B.** (2000). ***The elements of style*** (4th ed.). New York: Macmillan (*eBook)*.

2. **Cauraugh, J. H.** (2020**).** ***Research Methods: Functional Skills – Third Edition****. ISBN: 978-1-939337-34-4 (eBook).*

COURSE FORMAT

Physical presence lectures encourage interactions and active learning. This process involves students answering questions, solving problems, and discussing science topics. Prepared students read the required *Research Methods eBook* and combine the information with their APK areas of interest. Expect to be asked questions daily.

SUCCESS: A MOTIVATIONAL PERSPECTIVE

Your RM experiences will be meaningful given that you actively use the information in the *eBook (Research Methods: Functional Skills, 2020; Third Edition)* as well as the information presented and discussed in lectures. Enjoy this exposure to the scientific arena. The teaching style of this course is primarily reciprocal interaction with frequent, relevant questions used to practice memory retrieval. You must be able to retrieve and use this knowledge in different situations. Our frequent research interactions will be more enjoyable if you relax and expect that I will ask you at least one question every class. Preferred interactions are based on logical thoughts and empirical evidence. Class preparation includes reading the *eBook* chapters before class and thinking about the scientific concepts. Importantly, the information for this course is readily learned when you make sincere efforts and embrace the topics. **Be a student who actively learns and attains her or his intellectual potential!**

COURSE LEARNING OBJECTIVES:

1. *Identify and apply the steps involved in the scientific method*
2. *Critique research articles and determine the quality of publications*
3. *Evaluate experimental designs and choose appropriate statistics to analyze data*
4. *Visually and verbally present experimental designs, data, and findings*
5. *Formulate a research question, generate a research hypothesis, and design a study*
6. *Identify methodology issues and discuss guidelines to improve scientific rigor and reproducibility*
7. *Discuss issues related to research ethics and responsible conduct of human and animal research*
8. *Outline the processes related to manuscript reviews, writing, authorship, and journal impact*

University Policies and Resources:

University policies are summarized on the Academic Policies & Resources page.

https://syllabus.ufl.edu/syllabus-policy/uf-syllabus-policy-links/

Course Policies

ATTENDANCE

Class attendance is expected, however, not required. Why should you attend lectures? To practice answering questions on specific Research Methods concepts and earn three points. Students who actively learn typically excel in RM.

PERSONAL CONDUCT & ACADEMIC INTEGRITY

UF students are bound by ***The Honor Pledge,*** which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at UF, the following pledge is either required or implied: "**On my honor, I have neither given nor received unauthorized aid in doing this assignment**."

The Honor Code (http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Further, you are obliged to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, then please consult with your professor.

EXAM MAKE-UP POLICY

A student experiencing an illness should visit the UF Student Health Care Center or their preferred healthcare provider to seek medical advice and obtain documentation. If you have an illness, family emergency or death, please contact the Dean of Students Office (www.dso.ufl.edu) and follow the DSO Care Team procedures for

documentation and submission of a request for make-up assignment (https://care.dso.ufl.edu/instructor-notifications/). The DSO will contact the instructor. Do not provide any documentation to the instructor regarding illness or family emergency. This is your personal and protected information. The DSO is qualified to receive and verify the documents you provide. The instructor will follow the recommendations from the DSO. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the online catalog at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx."

COURSE EVALUATIONS

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via Gator Evals. You can complete an evaluation in three ways: (a) Email you receive from GatorEvals, (b) Canvas course menu under GatorEvals, or (c) central portal link: https://my-ufl.bluera.com/
Summaries of course evaluation results are available at the GatorEvals site.

DEPARTMENT ADMINISTRATORS

For suggestions or concerns related to APK courses or programming, please contact:

- Dr. David Vaillancourt (he/him), APK Department Chair, vcourt@ufl.edu
- Dr. Demetra Christou (she/her), APK Department Vice Chair, ddchristou@hhp.ufl.edu
- Dr. Steve Coombes (he/him), APK Graduate Coordinator, scoombes@ufl.edu
- Dr. Anna Gardner (she/her), APK Undergraduate Coordinator, akgardner@ufl.edu

Commented [JA1]: This section is NOT required of syllabi, but something several APK instructors have adopted...in case it's something other departments may want to consider.

GRADING

In previous classes, students excelled who accurately answered questions during lectures, completed the science journal entries, and scored well on each of the three required exams.

UF's catalog provides detailed information regarding current UF grading policies: *https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/*. Any requests for additional extra credit or special exceptions to these grading policies may be interpreted as an honor code violation (i.e., asking for preferential treatment) and will be managed accordingly.

Format on exams: combination of multiple-choice questions, definitions, short essays, long essays, calculations, and interpreting findings.

Evaluation Criteria	*Points Per Criteria*	*Percentage of Total Grade*
Class Participation	**3**	**3%**
Science Journal	**3**	**3%**
Exam 1: Feb. 9, Monday	**32**	**32%**
Exam 2: March 11, Wednesday	**32**	**32%**
Exam 3: April 20, Monday	**30**	**30%**
Total	**100**	**100%**
[No class participation = 0 points]		

GRADING SCALE

After taking Exams 1 and 2, you will be able to see your performance during the next class period while we go over the exams in class. Given that you will only write your GatorID on the exams, the next class you will claim your exam, and print your name on the first page. Even though exam percentages are posted on Canvas, grades are officially calculated in an Excel file on my computer. An Excel printout is always available after the exams.

Letter Grade	Total Points Required to Earning Each Letter Grade
A	**≥ 91**
A-	**89**
B+	**88**
B	**81**
B-	**79**
C+	**78**
C	**71**
C-	**69**
D+	**68**
D	**61**
D-	**59**
E	**≤58**

CRITICAL DATES & UF OBSERVED HOLIDAYS

- Monday, January 19, Martin Luter King, Jr. Holiday
- Monday, March 16 – 20, Spring Break
- Thursday & Friday, April 23 & 24, Reading Days

WEEKLY SCHEDULE

Lecture	*Research Methods: Functional Skills (3rd edition)* Chapter & Heading		Content
1	**Syllabus & Preface**		Overview; An approach to Science; Importance of RM & Science
2	**Chapter I**: 1.1 – 1.5		Causal Relationships; Types of Research; Two Supreme Analytical People
3	1.6 – 1.11		Science, Exp. Design, Variability, & Statistics
4	**Chapter II:** 2.1 – 2.5		IVs: Main Effects, & Interactions Voluntary Motor Actions: ME & Interactions
5	2.6 – 2.9		MEs & Interactions: Matrix Visually Displaying Two-way Interactions Two Frequently Used Statistics: *t* & *F* tests

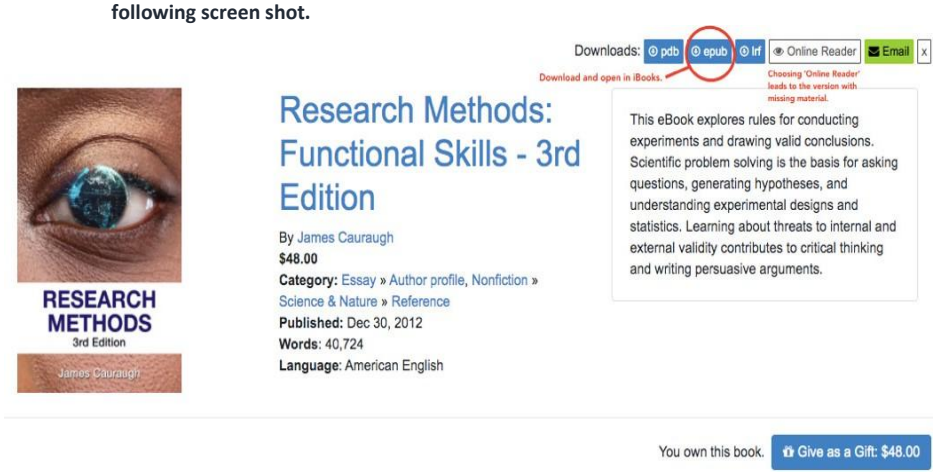
6	**Chapter III:** 3.1 – 3.4	Designs Vary by Three Criteria Different Designs: One-way & Two-way
7	3.5 – 3.8	Designs: Between-subjects, Within-subjects, & Mixed Review
Feb. 9	***Exam 1: 32 points***	***eBook Chapters: Preface, I, II, & III*** ***Strunk & White (first half)***
1 & 2	**Chapter IV**: 4.1 – 4.7	Statistical Significance & Reminders One-tailed & Two-tailed Tests Multiple Comparison Procedures Null & Alternative Hypotheses *F* Table Critical Values Truth Table & Power
3 & 4	**Chapter V**. 5.1 – 5.7	Internal and External Validity Eight Internal and Four External Threats Three Internally Valid True Experiments Three Pre-experimental Designs
5 & 6	**Chapter VI**: 6.1 – 6.10	Parametric & Nonparametric Statistics ANOVA Assumptions & Summary Table Chi-Square, Correlations, *t* & *F* Tests Hick-Hyman Law
March 11	***Exam 2: 32 points***	***eBook Chapters IV, V & VI*** ***Strunk & White (second half)***
1 & 2	**Chapter VII:** 7.1 – 7.9	Research Integrity & Oath for Scientists Ethics in Life & Science Institutional Review Board Protecting Rights of Individuals
3 & 4	**Chapter VIII**: 8.1 – 8.12	Writing: Clear, Concise, & Correct Four Evaluation Criteria & Questions to Ask Increase the Quality of Our English Language
5 & 6	**Chapter IX:** 9.1 – 9.7	Analysis of Covariance, Meta-Analysis, & Regression Analyses Multivariate Statistics & Saving Trees
7	**Chapter X**	Three Clinical Research Steps
April 20	***Exam 3: 30 points***	***eBook Chapters VII, VIII, IX, & X*** ***Review Previous Chapters***

Required Textbooks: Two e-Books

1. **Strunk, W., & White, E. B.** (2000). ***The elements of style*** (4th ed.). New York: Macmillan (*eBook)*.
2. **Cauraugh, J. H.** (2020**).** ***Research Methods: Functional Skills*** **–** ***Third Edition****. (eBook).*

The two eBooks are at three **electronic sources. Cut and paste one into your browser.**

1. **Smashwords**: http://www.smashwords.com/books/search?query=cauraugh
a. Download a free Kindle app to your laptop computer, iPad, or iPhone.
b. Download a version to read on your Kindle app.
c. Marking and searching the text will be easy on the Kindle app.
d. When you buy the book on Smashwords, be sure to get the iBook version. **Download the 'epub' file, then you will be able access and read in iBooks. Click epub (inside the red circle) as shown in the following screen shot.**



2. Apple iBooks; For Apple iPad/iPhone/iPod Touch, download the free Apple iBooks app and buy the eBooks on your iTunes account.

https://books.apple.com/us/book/research-methods-functional-skills-3rd-edition/id1278898939

3. Amazon – Kindle or Kindle Fire app reading:
http://www.amazon.com/dp/B00AUZPSSY

Science Journals: Reading, Thinking, and Writing

- Lectures are given on Mondays and Wednesdays
- Fridays are individual active learning days
- ***Seven learning activities are scheduled for Spring 2026***
- Reading, thinking, and writing about science outside of the classroom is enlightening

Friday activities: your task is to create seven science journal entries during the semester. Save all entries in one file. The first week of March, you will send your file with the first four journal entries to a classmate for reading and a cursory review. At the same time, you will read a set of four journal entries written by a classmate. The evaluation criteria are writing style and organization. To earn the **three journal points**, you must complete three phases: (a) do journals 1 – 4, save in one file, and send them to a classmate for review, while you review her/his entries, (b) do journal entries 5 – 7, and (c) upload your science journal file with **seven entries to Canvas at Assignments by Wednesday, April 22, 2026.**

1. *Web of Science: https://www.webofscience.com/wos/woscc/basic-search*
    a. *Journal Citation Reports:*
        i. *What are the impact factors of seven journals relevant to APK areas of study?*
        ii. *List the journal titles and two impact factors for each journal*
        iii. *2- Year impact factor (2024) and the 5-Year impact factor*
        iv. *Logon with Gator1 and follow three steps:*
            1. *Click Products [top right corner of homepage]*
            2. *On next page, Click Journals [left side of page]*
            3. *Type in a journal title [top middle of page], and record the two sets of impact factors*

2. *PubMed: https://pubmed.ncbi.nlm.nih.gov/*
    a. *Search PubMed:*
        i. *Select and read a refereed journal article on a topic that is interesting to you*
        ii. *Record the full citation of the article in your science entry*
        iii. *Summarize the article*

3. *Web of Science: https://www.webofscience.com/wos/woscc/basic-search*
    a. *Author Citation Report*
        i. *Select three APK Associate Professors or Full Professors and two recent Nobel Prize Winners*
        ii. *For the five authors: record*
            1. *Number of publications*
            2. *Number of citations*
            3. *Define H-index and list the current total number for each author*

4. *PubMed: https://pubmed.ncbi.nlm.nih.gov/*
    a. *Search PubMed for an article by Seals DR*
        i. *Article title: Publishing particulars: Part 1. The big picture*
        ii. *Journal citation: Am J Physiol Regul Integr Comp Physiol 2023 Mar 1;324(3):R381-R392. doi: 10.1152/ajpregu.00265.2022. Epub 2023 Feb 7*
        iii. *Read and think about the article*
        iv. *Summarize the article in 250 words or less*

5. *PubMed: https://pubmed.ncbi.nlm.nih.gov/*
    a. *Search PubMed for an article by Wagner PD*
        i. *Article title:* Writing up your research results for publication
        ii. *Journal citation: Chest 2009 Aug;136(2):639-642. doi: 10.1378/chest.08-2620*

iii. *Read and think about the article*
iv. *Summarize the article in 250 words or less*

6. *PubMed: https://pubmed.ncbi.nlm.nih.gov/*
    a. *Search PubMed for an article by Seals DR & Tanka H*
        i. *Article title: Manuscript peer review: a helpful checklist for students and novice referee**s***
        ii. *Journal citation: Adv Physiol Educ 2000 Jun;23(1):52-8. doi: 10.1152/advances.2000.23.1.S52*
        iii. *Read and think about the article*
        iv. *Summarize the article in 250 words or less*

7. *NaviGator AI: https://chat.ai.it.ufl.edu/c/new*
    a. *Note: NaviGator Chat has been migrated to Open WebUI*
    b. *On top left: click V to activate model choices: **select Model gpt-5***
    c. *Reply to "How can I help you today?"*
    c. *An example: 'Outline an article on a topic you enjoy reading'*
    d. *Replace 'topic you enjoy reading with a specific named topic'*
    e. *Purpose, research hypothesis, experimental design, methods, and appropriate statistical analysis*

Save all seven journal entries in one file and upload the file to Canvas at Assignments by Wednesday, April 22, 2026