

Research Methods

APK 4050 | Class # 16750 | 3 Credits | Spring 2025

Connect with HHP



Course Info

INSTRUCTOR

James Cauraugh, Ph.D.
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Preferred Method of Contact: Email

OFFICE HOURS

Virtual by appointment. Send an email to request a time to Zoom.
Teaching Assistants are available via email as well as GroupMe

MEETING TIME/LOCATION

**Monday, Wednesday, & Friday 8th Period: 3:00 – 3:50 PM; FLG 285
Section 338B. Code name: East**

Access course syllabus, journal guidelines, and unofficial grades are 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. Class preparation includes reading the eBook chapters before class and thinking about the scientific concepts. Preferred interactions are based on logical thoughts and empirical evidence. Importantly, the information for this course is readily learned when you give 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*
9. *Conduct a literature search and manage references*

Course & University Policies

ATTENDANCE POLICY

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

PERSONAL CONDUCT POLICY

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>.”

ACCOMMODATING STUDENTS

Students who experience learning barriers may request academic accommodation. Contact the Disability Resource Center by visiting their Get Started page at <https://disability.ufl.edu/students/get-started/>. Early in the semester, share your accommodation letter and discuss access needs with your professor. Exams are given in a quiet room in the Florida Gym.

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 will be notified later in the semester asking for your input at the following link: <https://my-ufl.bluera.com/>

Getting Help

HEALTH & WELLNESS

- U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575
- Counseling and Wellness Center: <https://counseling.ufl.edu/>, 352-392-1575
- Sexual Assault Recovery Services (SARS) - Student Health Care Center, 392-1161
- University Police Department, 392-1111 (or 9-1-1 for emergencies) <http://www.police.ufl.edu/>

ACADEMIC RESOURCES

- E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu. <https://lss.at.ufl.edu/help.shtml>
- Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling. <https://career.ufl.edu/>
- Library Support, <http://cms.uflib.ufl.edu/ask>. There are several ways to receive assistance with respect to using libraries or finding resources.
- Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring. <http://teachingcenter.ufl.edu/>
- Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and drafting papers. <http://writing.ufl.edu/writing-studio/>
- Student Complaints On-Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/> On-Line Students Complaints: <http://distance.ufl.edu/student-complaint-process/>

APK ACCESSIBILITY

- Dr. Ashley Smuder, Liaison, asmuder@ufl.edu
- Dr. Joslyn Ahlgren, Undergraduate Coordinator, jahlgren@ufl.edu
- Dr. Stephen Coombes, Graduate Coordinator, scoombes@ufl.edu

Grading

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

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.

<i>Evaluation Criteria</i>	<i>Points Per Criteria</i>	<i>Percentage of Total Grade</i>
Class Participation	3	3%
Science Journal	3	3%
Exam 1: February 5, Wednesday	32	32%
Exam 2: March 10, Monday	32	32%
Exam 3: April 30, Wed., 3:00 – 5:00 PM	30	30%
Total	100	100%
[No class participation = 0 points]		

GRADING SCALE

After taking Exams 1 and 2, on the following class period, you will see your performance while we go over the exams in class. Given that you will only write your GatorID on the exams, the next class will have time for you to 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 Earn 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

Weekly Course Schedule:

CRITICAL DATES & UF OBSERVED HOLIDAYS

- Martin Luther King Jr. Day, Monday, January 20
- Spring Break: Saturday, March 15 – Sunday, March 23
- Reading Days: Thursday & Friday, April 24 & 25

WEEKLY SCHEDULE

Lecture	<i>Research Methods: Functional Skills (3rd edition)</i> Chapter & Heading	Content
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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: <i>t</i> & <i>F</i> 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. 5	Exam 1: 32 points	<i>eBook Chapters: Preface, I, II, & III Strunk & White (first half)</i>
1 & 2	Chapter IV: 4.1 – 4.7	Statistical Significance & Reminders One-tailed & Two-tailed Tests Multiple Comparison Procedures Null & Alternative Hypotheses <i>F</i> 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, <i>t</i> & <i>F</i> Tests Hick-Hyman Law

March 10	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 30 3:00 – 5:00 PM	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 a source 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.



Research Methods: Functional Skills - 3rd Edition

By James Cauraugh
\$48.00

Category: Essay » Author profile, Nonfiction »
Science & Nature » Reference

Published: Dec 30, 2012

Words: 40,724

Language: American English

Downloads: [pdf](#) [epub](#) [lrf](#) [Online Reader](#) [Email](#) [x](#)

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Choosing 'Online Reader'
leads to the version with
missing material.

This eBook explores rules for conducting experiments and drawing valid conclusions. Scientific problem solving is the basis for asking questions, generating hypotheses, and understanding experimental designs and statistics. Learning about threats to internal and external validity contributes to critical thinking and writing persuasive arguments.

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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>

Research Methods: APK 4050 (# 16750), Section 338B, East Science Journals: Watching, Reading, Thinking, and Writing

- Lectures are given on Mondays and Wednesdays
- On Fridays you will complete an individual active learning day (no lecture)
- **Ten learning activities are scheduled for Spring 2025**
- Use your new RM knowledge while **Watching, Reading, Thinking, and Writing**
- Writing and thinking about science and RM outside of the classroom is enlightening

Every Friday your task is to create one science journal entry and save the entry in one file. Early in March, you will send your file with your first five journal entries to a classmate for reading and a cursory review. At the same time, you will read a set of five journal entries written by a classmate. The evaluation criteria are writing style and organization. To earn the full **three** points, you must complete three phases: (a) do journals 1 – 5, save in one file, and send them to a classmate for review, while you review her/his entries, (b) do journal entries 6 – 10, and (d) upload your science journal file with **10 entries at Assignments in Canvas by Friday, April 18, 2025.**

1. *Jim VandeHei: How to write less but say more*

https://www.ted.com/talks/jim_vandehei_how_to_write_less_but_say_more

November 2021

2. PubMed Search: <https://pubmed.ncbi.nlm.nih.gov/>
 - a. Pick a topic
 - b. Search PubMed on your topic and download a journal article
 - c. Answer seven questions:
 - a. What is the full citation for the article?
 - b. What was the purpose?
 - c. What was the independent variable or factor manipulated?
 - d. What was the dependent variable or outcome measure?
 - e. What was the experimental design?
 - f. What statistic was used to analyze the data?
 - g. What findings were reported?

3. NaviGator AI: <https://chat.ai.it.ufl.edu/c/new>
 - a. Click Model gpt-4o [top left on homepage]
 - b. At the paperclip symbol [middle bottom of page] type a statement or ask a question
 - c. Define a true experiment
 - d. Define experimental design
 - e. Define research hypothesis
 - f. What are the top four statistics?
 - i. Define mean, standard deviation, and median
 - g. What are the most common statistical analyses?
 - h. Copy and paste replies to c – g into your journal [screen shot or download]

4. 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 (2023) and the 5-Year impact factor
 - iv. How? 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**

5. Shawn Achor: **The happy secret to better work**

https://www.ted.com/talks/shawn_achor_the_happy_secret_to_better_work?showTranscriptTooltip=true

May 2011

6. Adam Grant: **How to stop languishing and start finding flow**

https://www.ted.com/talks/adam_grant_how_to_stop_languishing_and_start_finding_flow?referrer=playlist-the_most_popular_ted_talks_of_2021&autoplay=true

August 2021

7. *Daniel Pink: The puzzle of motivation*

https://www.ted.com/talks/dan_pink_the_puzzle_of_motivation?referrer=playlist-the_most_popular_ted_talks_of_all_time&autoplay=true

July 2009

8. *Web of Science: <https://www.webofscience.com/wos/woscc/basic-search>*

a. *Author Citation Report*

- i. *Select three APK 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 number*

9. *NaviGator AI: <https://chat.ai.it.ufl.edu/c/new>*

- a. *Click Model gpt-4o [top left on homepage]*
- b. *At the paperclip symbol [middle bottom of page] type a statement or ask a question*
- c. *'Outline an article on stroke motor recovery.'*
- d. *Replace stroke motor recovery with a preferred topic*

10. *AmericanRivers.org/Colorado: I am Red –The Colorado River*

<https://www.americanrivers.org/rivers/films/i-am-red-the-colorado-river/>

2023

Suggestions: Save all 10 journal entries in one file and upload the file in Canvas Assignments by Monday, April 18, 2025

- A typical journal entry is three paragraphs. In the first paragraph summarize the TED Talk or article in your own words. Paragraph two contains your primary questions/thoughts that were generated and a brief discussion. The third paragraph provides answers to the questions you asked in paragraph two.
- Here is an example of a second paragraph written after watching a teenager driving a standard shift car:

How do we initiate, control, and terminate movements? Various movements such as walking, riding a bike, driving a car, writing, and exercising seem automatic with no apparent thought going into the exact sequence of movements before or during execution. When driving a car, I automatically push the clutch down, release the brake, turn on the ignition, and release the clutch. Seldom do I stall at traffic lights or fail to push the clutch in at the right time. Yes, today's cars are easier to drive than the stick shift I first drove on a back road. The required movements and the car's response appear natural now. How did I reach an automatic phase of learning with the clutch and gas? How do motor control and neuroscience researchers investigate these types of learning and control questions?

Exceptions: PubMed, Web of Science, and NaviGator AI tasks do not follow the three paragraph suggestions