

# Research Methods

APK 4050 | Class # 10200 | 3 Credits | Summer 2025

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## 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 Assistant is available via email as well as GroupMe

### MEETING TIME/LOCATION

**Monday – Thursday, 3:30 – 4:45 PM; Pugh 170 (Section 01F6)**  
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. 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*

## **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 three points. 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](http://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.

Do be aware of UF's Accessibility conversion site named [Sensus Access](https://accessibility.ufl.edu/services/sesusaccess/) (<https://accessibility.ufl.edu/services/sesusaccess/>). This user-friendly resource is a document conversion system (<https://disability.ufl.edu/>). Once you login to UF, you can convert documents into accessible formats.

## 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](mailto: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](mailto: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](mailto:asmuder@ufl.edu)
- Dr. Joslyn Ahlgren, Undergraduate Coordinator, [jahlgren@ufl.edu](mailto:jahlgren@ufl.edu)
- Dr. Stephen Coombes, Graduate Coordinator, [scoombes@ufl.edu](mailto: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>
<b>Class Participation</b>	<b>3</b>	<b>3%</b>
<b>Science Journal</b>	<b>3</b>	<b>3%</b>
<b>Exam 1: May 22, Thursday</b>	<b>32</b>	<b>32%</b>
<b>Exam 2: June 5, Thursday</b>	<b>32</b>	<b>32%</b>
<b>Exam 3: June 18, Wednesday</b>	<b>30</b>	<b>30%</b>
<b>Total</b>	<b>100</b>	<b>100%</b>
<b>[No class participation = 0 points]</b>		

### 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.

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

### Weekly Course Schedule:

#### CRITICAL DATES & UF OBSERVED HOLIDAYS

- May 26, Monday, Memorial Day
- June 19, Thursday, Juneteenth

#### WEEKLY SCHEDULE

Lecture	<i>Research Methods: Functional Skills (3<sup>rd</sup> edition)</i>	Content
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Chapter & Heading		
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1	<b>Syllabus &amp; Preface</b>	Overview; An approach to Science; Importance of RM & Science
2	<b>Chapter I: 1.1 – 1.5</b>	Causal Relationships; Types of Research; Two Supreme Analytical People
3	1.6 – 1.11	Science, Exp. Design, Variability, & Statistics
4	<b>Chapter II: 2.1 – 2.5</b>	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	<b>Chapter III: 3.1 – 3.4</b>	Designs Vary by Three Criteria Different Designs: One-way & Two-way
7	3.5 – 3.8	Designs: Between-subjects, Within-subjects, & Mixed Review
<b>May 22</b>	<b>Exam 1: 32 points</b>	<b><i>eBook Chapters: Preface, I, II, &amp; III Strunk &amp; White (first half)</i></b>
1 & 2	<b>Chapter IV: 4.1 – 4.7</b>	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	<b>Chapter V: 5.1 – 5.7</b>	Internal and External Validity Eight Internal and Four External Threats Three Internally Valid True Experiments Three Pre-experimental Designs
5 & 6	<b>Chapter VI: 6.1 – 6.10</b>	Parametric & Nonparametric Statistics ANOVA Assumptions & Summary Table Chi-Square, Correlations, <i>t</i> & <i>F</i> Tests Hick-Hyman Law
<b>June 5</b>	<b>Exam 2: 32 points</b>	<b><i>eBook Chapters IV, V &amp; VI Strunk &amp; White (second half)</i></b>

1 & 2	<b>Chapter VII: 7.1 – 7.9</b>	Research Integrity & Oath for Scientists Ethics in Life & Science Institutional Review Board Protecting Rights of Individuals
3 & 4	<b>Chapter VIII: 8.1 – 8.12</b>	Writing: Clear, Concise, & Correct Four Evaluation Criteria & Questions to Ask Increase the Quality of Our English Language
5 & 6	<b>Chapter IX: 9.1 – 9.7</b>	Analysis of Covariance, Meta-Analysis, & Regression Analyses Multivariate Statistics & Saving Trees
7	<b>Chapter X</b>	Three Clinical Research Steps
<b>June 18</b>	<b>Exam 3: 30 points</b>	<b>eBook Chapters VII, VIII, IX, &amp; X</b> <b>Review Previous Chapters</b>

**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

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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>

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## Research Methods: APK 4050 (# 10200), Section 01F6 Science Journals: Watching, Reading, Thinking, and Writing

- Lectures are given on Mondays through Thursdays
- No lectures on Fridays. These days are for individual active learning.
- **Seven learning activities are scheduled for Summer A 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 June, you will send your file with your 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 (d) upload your science journal file with seven **entries at Assignments in Canvas by Friday, June 13, 2025.**

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 (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**
2. *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]*

3. **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](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)

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4. *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 for each author*
5. *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. *An example: 'Outline an article on stroke motor recovery.'*
  - d. *You may replace 'stroke motor recovery' with your preferred topic*
6. *PubMed Search:* <https://pubmed.ncbi.nlm.nih.gov/>
  - a. *Pick a topic*
  - b. *Search PubMed on your topic, download the journal article, and read the 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 statistical procedure analyzed the data?*
    - g. *What findings were reported?*
7. *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 seven journal entries in one file and upload the file to Canvas Assignments by Friday, June 13, 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:** Web of Science, NaviGator AI, and PubMed tasks do not follow the three paragraph suggestions