



**Scientific Reasoning and Research Design
FYC 6800, Fall 2022 Section 800A
Wed., Period 3 (9:35 AM – 10:25 AM)
Fri., Periods 3-4 (9:35 AM – 11:30 AM)
In Person**

Instructor Information

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Office Hours: 10:45 – 11:45 Wednesday, by appointment

Phone: 352.273.3538 – rolls over to e-mail – leave a message

FYCS Diversity, Equity and Inclusion Statement

The UF/IFAS Department of Family, Youth and Community Sciences is committed to engaging positively in a global and diverse society through its teaching, extension, and research efforts. That commitment is demonstrated by creating an inclusive educational environment that fosters belonging as we mentor students, perform relevant scholarship, and conduct outreach for families, youth, and communities that is sensitive and responsive to the needs of diverse audiences. Intentional effort is made to providing access and equity to underrepresented, underserved, marginalized, and minoritized people in Florida and beyond. (adopted April 30, 2021)

Correspondence: All correspondence regarding this course must occur through your UFL e-mail account or e-learning. This is a UF regulation. I cannot respond to e-mails you send through other venues.

Course Submissions & Attendance: This class employs UF policy covering the student's responsibility for informing the professor of planned absences and illness. Requirements for class attendance, make-up exams, assignments and other work are consistent with university policies.

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>

Policies for Submissions

- Assignments and all other required are due before 11:59 PM on the date indicated on Canvas and at the course web site.
- Submit all materials through e-learning – do **not** submit through e-mail.
- If you have a valid reason to believe you will be late with a submission, contact me by telephone or e-mail to discuss your options.
- All late submissions (assignments, postings, etc.) will result in a reduction of 10 points per day to your total course score of 1000 points and after 48 hours, a score of 0 (zero) will be submitted for the assignment.

Consultation Policy: I will be available for individual or team consultations from 10:45 to 12:30 on Wednesday of each week **by appointment -- in person, by telephone or through video conference.** I will accommodate meetings outside of office hours as much as I can. **Please request a meeting by e-mail.**

Course Description: This course explores how science generates new knowledge, how to evaluate the applicability of research results in your professional work, and how to assess whether science-based claims are justified. 3 Cr., no prerequisites.

Course Goals

- Improve your ability to determine the degree to which you can apply reported research findings in your professional work
- Develop your capacity to create reliable research findings and reach science-based conclusions to address social problems, issues and needs
- Enhance your ability to assess science-based claims in order to make decisions in your personal and professional life.

Course Objectives -- After completing this course, you will be able to:

- Assess the strength of the empirical evidence that supports different explanations of why social problems, issues and needs have developed and what we should do to solve them
- Evaluate the empirical evidence and conclusions reached in research about social problems, issues and needs with an emphasis on internal and external validity and explanatory power
- Assess the degree to which sampling procedures described in the research literature are appropriate and likely to produce reliable and useful research findings and create your own sampling protocols
- Interpret and evaluate the rigor of the qualitative and quantitative data analysis procedures reported in the research literature and select appropriate analytic procedures for your own research
- Assess the strengths and weaknesses of research designs in the research literature that we use to inform practice and select appropriate designs, based on the nature of the research question, to use in your own work.

“Need to Know” for Success in this Course

- Research design and research methods are distinct components in scientific research and are largely independent of each other. Do not confuse the two. Therefore, prior training with research methods in graduate or undergraduate courses is not critical to success in this class. However, confusing the two will create problems for you. Some background in research methods may help you gain command of the language of research, which can be helpful in this class.
- You do not need prior experience or knowledge of statistics or any other form of data analysis to succeed in this course, but you do need to know the basic statistical concepts. This YouTube presentation is a good introduction (9 minutes long): <https://www.youtube.com/watch?v=-JXDd52XsQE>
- Do not fall behind in this course and consult with me when you are confused or struggling with the materials and assignments. Every class meeting will introduce different ideas and a good understanding of what went before is critical to understanding the new material.
- You need to know how to use the e-learning system at UF. You will submit all assignments and receive all of my comments through this system. If you are not familiar with it, go to
- <https://elearning.ufl.edu/e-learning-basics/uf-e-learning-faqs/>
- You have to be able to use the resources of the US library system. Melody Royster (mtoyster@ufl.edu) is the librarian for our department. Visit this website NOW if you have limited prior experience with the UF library system. (<https://guides.uflib.ufl.edu/familyyouthcommunity>)
- All materials used in this class except the textbook are available at no charge to you, BUT you must access the materials through Canvas or the UF library system. Make sure you use the VPN connection (virtual private network) for Off-Campus Access when you try to get journal articles or other UF materials. Journals may charge you if you do not use VPN.
- You must know how to use the UF library search engines in a sophisticated way to find appropriate

materials about research design for this class. Do not rely on Google, for example. Academic Search Premier is the recommended search engine through the library. Web of Science is a good engine.

- You must know how to use the UF library e-reserve system. There is a link to the reserve system through Canvas. Or click Course Reserves (bottom left under Students) at the library home page.
- I strongly encourage you to learn to use the citation management tools available through the library. These tools will save you hours of work in this class and throughout your graduate program. Consult the library website to learn about these tools.
- You need a very basic knowledge of social science theory, which includes theories of behavioral change like the theory of planned behavior or value, belief and norms theory. If you have no familiarity with or knowledge of social theory, please look at the materials provided under the link for “Theories” at the course home page.

Approach and Expectations

I provide a list of the performance criteria I use to evaluate each assignment. ***Read and understand the criteria for each assignment before you start to work on the assignment.*** It is not smart to try to complete a task without knowing how your performance will be judged.

Focus on thinking, not on repeating what others, including me, have said or written. I grade your performance in this course on your ability to apply the concepts that we discuss to analyze and evaluate research studies and to develop your own research. Simply repeating what you hear or read will earn 0 points for most evaluation criteria. I expect you to develop and demonstrate analytical and critical thinking skills in this class. These skills are prerequisites for using science to develop new knowledge and to effectively apply scientific knowledge.

I do not grade by page length. If you read efficiently (which we will practice), use all of the materials I provide, and practice “thinking before writing,” you will be able to respond much more quickly and effectively to my questions. If I say “list ...” I mean **bullet points, not paragraphs.**

Use, cite and reference the research design literature. This is a graduate course. I assume that you want to acquire the knowledge and skills needed to conduct your own research or evaluation and apply research findings in a professional capacity. I expect you to provide evidence in the form of citations in assignments and class participation that you have **consulted** the resources provided.

- ***Use*** means to tell me how you applied the ideas or concepts or conclusions in a specific resource that you consulted to **develop your response.** What was it that you learned and applied from Jones, from Smith, and from Williams? Example: “I considered Smith’s comments about the role of sample size in random sampling, which I found somewhat confusing. Jones’ explanation of the differences between a true random sample (what I believe Smith means) and the best achievable standard for a random sample (the pragmatic answer as Jones calls it) helped me understand how to determine a sample size that is doable and still provides a good basis for generalization of results.”
- ***Cite*** means that you place a citation in the body of your response. Look over the [material about plagiarism provided by the UF library](#). Give credit to authors when you “borrow” their ideas by citing the author. Paraphrasing – just changing a few words or saying “more or less” exactly what an author said also requires citation, including in many cases the page numbers.
- ***Reference*** means that you provide a full reference to the author’s work at the end of the assignment. Include all the materials that you cite. If you are not familiar with APA style, you probably need to buy

the style manual since most sciences use this format. Consult this [tutorial on APA style](#). I see one common error very often having to do with journal versus internet citation form. (1) Only use the APA style for *internet documents* if the material you cite is in html form and is therefore *subject to change over time*. In this case, you provide the URL and the date you downloaded the information. (2) Do **NOT use this format when you download a journal article**. Use the journal citation form. Journal articles do not change overtime.

It is critical that you explore the body of literature about research design beyond required readings to complete assignments. I base my evaluation of your performance, in part, on the degree to which you provide evidence that you have taken responsibility for your own learning experience and that you are actively seeking out resources to make the learning experience as meaningful as possible

I assess your class preparation and participation every week. **If you do not participate actively during class, you receive 0 points for class preparation and participation for the week.** In other words, simply coming to class does **not** generate points for your class preparation and participation.

Work together. Most of us learn more effectively when we can discuss our ideas with others. I encourage you to work together. Helping each other is **not** cheating. In fact, you will be able to award Give-A-Gator Points to one or more individuals who **really helped you learn** in the class.

Materials

Gorard, Stephen. (2013) *Creating Robust Approaches for the Social Sciences*. Sage Publications. **Required Textbook**

Frey, Bruce A. (2016) *There’s a Stat for That!* Sage Publications. **Optional**

Most of the additional readings for the course consist of research journal articles. Some are chapters of books of mine that I have placed on e-reserve. I also provide a list of suggested readings for most topics. These will be useful in completing the assignments.

Distribution of Grade	Points
Class Preparation & Participation	100
Research Reviews	50
Assignment 1 Proof of Completion of Human Subject Research Training	50
Assignment 2: How to Read a Research Report (individual assignment) Part 1, The Research Question Part 2, The Conclusions	125
Assignment 3: How to Read a Research Report (Individual assignment) Part 3, Sampling Part 4, Data Analysis	125
Assignment 4: Experimental Design (group assignment)	200
Team Member Assessment for Assignment 4	25
Assignment 5: Non-Experimental Design (group assignment)	200
Team Member Assessment for Assignment 5	25
Assignment 6: Relationships between Research Design and Internal Validity, External Validity and Explanatory Power (individual assignment)	100
TOTAL	1000

Grading Philosophy and Approach

My goal is for every student to earn an A in this course. I expect to see increased mastery of the concepts and ideas that we discuss as we progress through the course. Therefore, expectations grow as the semester progresses and what was an acceptable or adequate response on an early assignment may **not** be acceptable on a later assignment. I try to provide useful comments for every assignment in addition to a numerical score. My intent is to help you recognize both the weaknesses **and** the strengths in your submissions – which will help you improve performance on future assignments. However, I have three sections in this class and my time is limited. I am sure I will end up concentrating more on telling you how to improve than congratulating you on the things you did well. Please accept my apology for the “biased” nature of the comments you will probably get.

Grading Scale

A	95 – 100%	A-	90-94%		
B+	87-89%	B	83-86%	B-	80-82%
C+	77-79%	C	73-76%	C-	70-72%
D+	67-69%	D	63-66%	D-	60-62%
E	<60%				

For information on current UF policies for assigning grade points, see <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Class Preparation and Participation

I expect you to participate actively and positively in classroom activities and to demonstrate through your comments and participation that you have prepared for class. I want you to read the assigned materials **quickly and efficiently to gain a few key ideas.** Focus on the key ideas. For most readings, I provide some discussion questions that point to the key ideas I want you to understand. There will be topics and ideas covered in most materials that I do not think are important enough to ask about – **skim those sections and focus on the ideas I stress.** I indicate other specific preparation for class for most weeks. Consult the web site for each week to make sure that you complete these preparations.

I score class preparation and participation for 14 of the 16 weeks in the semester. These scores are based on your **active contribution to classroom discussions and activities and evidence in your comments, including postings, that you prepared for class.** Your presence in the classroom (virtual or physical) in and of itself does **NOT** earn any points for class preparation and participation. I will provide a numeric score on class preparation and participation 4 times during the semester, after week 4, after week 8, after week 12 and at the end of the semester. The maximum score for each four-week period is 25 points.

Weekly Schedule

Week	Date	Topic	Submissions Due	Due Date
1	8/24	Introductions, Course Expectations & Review of Syllabus	None	
	8/26	Thinking Like a Scientist	Assignment 1: Proof of Training in Human Subjects Research	8/29
2	8/31	Reading Productively	Post Full Reference for Article Selected for Assignments 2 & 3	8/31

	9/02	How Science Works – The Cycle and Proving Ourselves WRONG		
3	9/07	Work on Assignment 2	Assignment 2: How to Read a Research Report Part 1: Question & Objectives	9/08
	9/09	The Research Question & Overview of Design Types		
4	9/14	The Conclusions: What We Can and Cannot Say	Assignment 2: How to Read a Research Report Part 2: Conclusions	9/15
	9/16	Validity & Reliability of Conclusions		
5	9/21	Key Concepts in Sampling	Posting to Weekly Board	9/22
	9/23	Sampling Principles & Types of Samples		
6	9/28		Posting to Weekly Board	9/29
	9/30	Statistical Analyses		
7	10/5		Assignment 3: How to Read a Research Report Part 1: Sampling	
	10/7	Qualitative Analyses		
8	10/12		Assignment 3: How to Read a Research Report Part 2: Data Analysis & Results	10/13
	10/14	Experimental Design		
9	10/19	Work on Assignment 4		
	10/21	Cross-Sectional Designs		
10	10/26		Colleagues Review Experimental Designs - In Class	
	10/28	Longitudinal Designs		
11	11/2		Assignment 4: Experimental Design	11/3
	11/4	Case Study Designs		
12	11/9	Select Design for Assignment 5 – Anything BUT an Experiment	Post selection by end of class	11/10
	11/11	HOLIDAY – NO CLASS	HOLIDAY – NO CLASS	
13	11/16	Work on Assignment 5	Assignment 5: Non-Experimental Design	
	11/18	Design, Rigor in & Impact of Research		
14	11/23	HOLIDAY – NO CASS	HOLIDAY – NO CASS	
	11/25	HOLIDAY – NO CASS	HOLIDAY – NO CASS	
15	11/30	Review of the Research Cycle		11/31
	12/02	Work on Assignment 6	Submit Assignment 6	
16	12/07	LAST DAY OF CLASSES!	Award Give-A-Gator Points	

Research Reviews

Citing and using published material about research design is an important part of your grade. **Using research design literature beyond required materials is an evaluation criterion on most assignments.** On two occasions, I will assign a reading for you to review. Your objective is to provide your colleagues with a clear, concise description of the major points in the article **about research design**. **Focus on what you learned about research design, not the subject matter or results of the study itself**, especially if your review is of a research report. For example, you might find a good discussion of some of the problems with referral (snowball) sampling in a research report about teenage risky behaviors.

Do not focus on the data that they collected and their results. Focus on what you learned about referral sampling. Be brief. You are giving your colleagues a “heads up” about a good source of materials about research design. They have to decide if they want to consult the material or not. You can use any kind of article – research reviews, methodological discussions, published literature about a specific topic of concern like sampling, and research reports. I provide a list of suggested readings for most topics. You will probably find some excellent materials on your own, too. Title the document **YourLastName_LastNameofFirstAuthor_Keyword or phrase that describes the content of interest** (such as explanatory power, qualitative analysis, or retrospective design). Include the following components in your document.

- Your full name
- Citation for the article in APA style
- List of 5-7 key words that indicate the content of the article **relevant to research design**
- 3-5 Key points about **research design** (not the topic of the article), **maximum 50 words per point**.

Assignments

You will complete four individual and two group assignments. I provide learning objectives for each assignment, and I list the criteria that I use to evaluate your performance. Submit all assignments through Canvas. I do not include the detailed instructions here. The specific instructions for each assignment are provided through the Assignments link and in the table on the course home page and through a link for each assignment on Canvas.

Team Member Assessment. Your peers will evaluate your contribution to the group effort for completing Assignments 4 and 5. You submit these assessments of your colleges under an assignment in Canvas to ensure privacy -- Peer Review for Assignment 4 and Peer Review for Assignment 5. The procedure is described in more detail and I provide a list of factors to consider in your assessment with the assignments. You will list each member of your team and indicate the number of points you want to award to each person as a comment in Canvas (NOT a Word document). Provide **no other information or comments**. Here is what I should see: Sally Everston – 7 points, Julio Alvarado – 8 points, Alysha Achyara – 0 points.

Give-A-Gator Points

You may award **Give-A-Gator** Points to people who help you master the content and succeed in this class. These are bonus points not included in the 1,000 possible points in the table above. You can award up to 50 points **total**. You may award the points to one person, split the points between two people (e.g., 35 and 15) or split the point between three people (10, 25, 15). Awarding points is **not** required and you may award fewer than 50 points. **Only award Give-A-Gator Points if someone really did help you understand and learn in this class.** This is **NOT** for your best friend or the nicest person in the class. Enter your Give-A-Gator points through the e-learning assignment called “Give-A-Gator Points.” Write the complete name of the person (first and last) and the number of points to award in the assignment space. Provide no other information. This opportunity is open during the last two weeks of class.

University of Florida Policies

Attendance and Make-Up Work

Requirements for class attendance and make-up exams, assignments and other work are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Online Course Evaluation Process

Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

Academic Honesty

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: *"We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity."* You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: *"On my honor, I have neither given nor received unauthorized aid in doing this assignment."* It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, see: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>

Software Use

All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

Services for Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation 0001 Reid Hall, 352-392-8565, www.dso.ufl.edu/drc/

Campus Helping Resources

Students experiencing crises or personal problems that interfere with their general wellbeing are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,
www.counseling.ufl.edu/cwc/

Counseling Services Groups and
Workshops Outreach and
Consultation Self-Help Library
Wellness Coaching

U Matter We Care, www.umatter.ufl.edu/

Career Resource Center, First Floor JWRU, 392-1601, www.crc.ufl.edu/

Student Complaints

Residential Course: https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf

Online Course: <http://www.distance.ufl.edu/student-complaint-process>