**University of Florida**
**EXP4174C: Sensory Processes Lab**
**Fall 2022: Mondays & Wednesdays, 9:35am – 11:30am, PSY 0191**

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|---|---|---|---|
| **Instructor:** | **Brian Odegaard, Ph.D.** | **TAs:** | **Ashish Sahoo & Ece Yuksel** |
| Office: | PSY 86 | | Office:  PSY 98b (for both!) |
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| E-mail: | bodegaard@ufl.edu | | Monday 12pm-1pm |
| Office Hours: | Thursdays: 7:30am-9:30am or Zoom | | Ece: |
| | if nec (Link on Canvas) | | Tuesdays 9-11am |

## COURSE FUNDAMENTALS

### Course Overview

Welcome to the course! This lab provides hands-on experience in the methods and approaches of perceptual psychophysics. Students in this class will learn and apply methods of scientific communication, summarize results, do lab write-ups, present data, and write a final paper. Activities in the lab will challenge students to think carefully and critically about every aspect of the research process, relating these to benefits and limitations of the scientific method in psychological research. After completing a progression of small assignments involving data care, students conduct instructor-supervised group projects to run an experiment of their own. Students will collect, analyze, and present the results of behavioral data collected from psychological experiments. In the end, students will judge similarities and differences between the methods and results of their own experiments.

### Course Objectives

By the end of this course, you will be able to:
- Be able to program experiments and analyze data in MATLAB.
- Learn how research paradigms relate to the gaps in knowledge we seek to fill.
- Understand how experiments work.
- Learn how to use and summarize experiment data in an open and reproducible way.
- Become proficient in communicating research methods and findings.

### Course Protocols

In this course, we will be focusing on state-of-the-art methods for creating experiments, collecting data, analyzing and visualizing results, and reporting statistics. This will include some programming, which is an indispensable part of modern scientific research in most fields. In the course, you will learn to do each of these research steps in MATLAB and Psychtoolbox. However, if there is another language you prefer (such as R or Python), you are welcome to use that instead. We will have a great deal of class time devoted to learning these skills, but you are welcome to contact the TA or instructor with any questions or requests for additional assistance on these tools (as well as any other part of class).

Studying and working together on assignments is permitted, and working together on final projects is highly encouraged, but **everything you turn in must be original and written in your own words.** The University and instructors reserve the right to penalize any student who is guilty of academic misconduct, including but not limited to plagiarism, collusion, cheating, or discrimination or harassment. Students are welcome to use any resources at their disposal (notes, papers, internet) for all lab reports and assignments, but these should be completed on your own (not in groups, no stack exchange, no asking your faculty advisor, etc.).

### Grading

**Your grade(s) in the course will be based on a combination of attendance / participation (10%), lab activities (30%), lab reports (30%), and your final project (30%) as follows:**

| Assignment | Points (%) | Due |
|---|---|---|
| **Participation & Attendance** | **50 (10%)** | **End of semester** |
| **Lab Activities – Total 150 (30%)** | | |
| **Threshold activity** | **30 (6%)** | **9/12** |
| **Visual Search activity** | **30 (6%)** | **9/26** |
| **Stroop Task activity** | **30 (6%)** | **10/12?  TBD.** |
| **Attentional Blink activity** | **30 (6%)** | **10/31** |
| **Signal Detection activity** | **30 (6%)** | **11/14** |
| **Lab Reports – Total 150 (30%)** | | |
| **Lab Report #1** | **30 (6%)** | **9/19** |
| **Lab Report #2** | **30 (6%)** | **10/3** |
| **Lab Report #3** | **30 (6%)** | **10/17** |
| **Lab Report #4** | **30 (6%)** | **11/7** |
| **Lab Report #5** | **30 (6%)** | **11/21** |
| **Final project – Total 150 (30%)** | | |
| **Final project methods** | **50 (10%)** | **11/30** |
| **Final project full report** | **100 (20%)** | **12/15 (5 p.m.)** |
| **Total** | **500 (100%)** | |

**Grading Scale**

| | | | |
|---|---|---|---|
| **90-100%** | **A** | **72-74.9%** | **C** |
| **87-89.9%** | **A-** | **69-71.9%** | **C-** |
| **84-86.9%** | **B+** | **66-68.9%** | **D+** |
| **81-83.9%** | **B** | **63-65.9%** | **D** |
| **78-80.9%** | **B-** | **60-62.9%** | **D-** |
| **75-77.9%** | **C+** | **0-59.9%** | **E** |

**See the [Current UF Grading Policies](#) for more information.**

There are two ways to earn credit for participation & attendance. One is to show up in class and actively participate in discussions, which will be noted by your instructor. Another is to make a discussion post on Canvas that includes both (a) a question pertinent to the reading / topic of the day, to be posted before class; and (b) a post-class reflection on how your thinking has changed (or not) based on the class content that day. **Plan to complete one of these two options for at least 20 classes during the semester for full credit.** Your engagement in the group final project (as rated by your team) will also count toward this grade, so be sure to play your part in completing it!

Writing Requirement. This course counts for 2000 words toward the course requirements for writing. Note that the instructor will assign a course grade for both the course as a whole as well as the writing component (so don't skip the writing assignments!), as described in the course catalog:
**https://catalog.ufl.edu/UGRD/student-responsibilities/writing-requirement/**


**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 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." The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor in this class.

## Absences
In general, acceptable reasons for absence from or failure to participate in class include career-relevant activities like academic conferences or workshops, illness, serious family emergencies, military obligation, severe weather conditions, religious holidays, participation in official university activities, or court-imposed legal obligations (e.g., jury duty or subpoena). All of these will be excused when it comes to attendance / participation grades – just let the instructor know as soon as possible before class.

## Respect and non-discrimination
Respect for fellow students and instructors is expected of all class attendees. Intentionally disruptive or disrespectful conduct affecting other students may result in removal from the class session or from the course altogether.

## Sexual Harassment
Sexual Harassment is not tolerated in this class, in the Department of Psychology, or at the University of Florida.  Sexual harassment includes: the inappropriate introduction of sexual activities or comments in a situation where sex would otherwise be irrelevant. Sexual harassment is a form of sex discrimination and a violation of state and federal laws as well as of the policies and regulations of the university.  All UF employees and students must adhere to UF's sexual harassment policy which can be found here: https://hr.ufl.edu/forms-policies/policies-managers/sexual-harassment/. Please review this policy and contact a university official if you have any questions about the policy.  As mandatory reporters, university employees (e.g., administrators, managers, supervisors, faculty, teaching assistants, staff) are required to report knowledge of sexual harassment to UF's Title IX coordinator.  You can also complete a Sexual Harassment Complaint Form (Title IX) here: https://titleix.ufl.edu/title-ix-complaint-form/.

## Accommodation for Disabilities.
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, https://disability.ufl.edu/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

## Course feedback
Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

**In-class Recording**
Our class sessions may be audio visually recorded for students in the class to refer back to and for enrolled students who choose to attend online. Students who participate online with their camera engaged or utilize a profile image are agreeing to have their video or image recorded.  If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded.  If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared.

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A "class lecture" is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To "publish" means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

**COVID-19:**  In response to COVID-19, the following recommendations are in place to maintain your learning environment, to enhance the safety of our in-classroom interactions, and to further the health and safety of ourselves, our neighbors, and our loved ones.
- If you are not vaccinated, get vaccinated. Vaccines are readily available and have been demonstrated to be safe and effective against the COVID-19 virus. Visit one.uf for screening / testing and vaccination opportunities.
- If you are sick, stay home. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 to be evaluated.
- Course materials will be provided to you with an excused absence, and you will be given a reasonable amount of time to make up work.

**Weekly Class Schedule:**

You may attend class either in person or online. If you choose to attend online, **your camera must be on at all times.** You can join via the Zoom at link provided in Canvas for a given class day:

| Week | Topic | Lab / programming skill | Assignment due |
|---|---|---|---|
| 0 | (8/24) Introduction to the course | | |
| 1 | (8/29) Asking scientific questions<br>(8/31) Programming languages | Using UFApps<br>MATLAB interface | (Reading – N73)<br>(Reading – O17) |
| 2 | (9/5) NO CLASS – Labor Day<br>(9/7) Bad practices/designing exps. | Variables & data types | (Reading – C17-1) |
| 3 | (9/12) Methods sections in a paper<br>(9/14) Formatting in LaTeX / Math | Vectors, arrays, matrices<br>Computing summary stats | Threshold activity<br>(Reading – N21) |
| 4 | (9/19) Math in science<br>(9/21) Literature searches | Saving & loading<br>Loops & functions | Lab Report #1<br>(Reading – E99) |
| 5 | (9/26) Scientific inference<br>(9/28) The replication crisis | Linear algebra<br>Plots & Visualizations | Visual search<br>(Reading – C17-2) |
| 6 | (10/3) Probability distributions<br>(10/5) Is reproducibility enough? | Adding figures to text<br>Inferential statistics | Lab Report #2<br>(Reading – C17-3) |
| 7 | (10/10) Simulation-based analyses<br>(10/12) Results sections | Reporting your results<br>Bayes rule | Stroop Task?<br>(Reading – W18) |
| 8 | (10/17) Classical vs Bayesian stats<br>(10/19) Drawing conclusions | Bayesian statistics<br>Analysis using JASP | Lab & activity #3<br>(Reading – C14) |
| 9 | (10/24) Abstracts & headings<br>(10/26) Figures and diagrams | Psychtoolbox<br>Displaying stimuli | Final project survey<br>(Reading – R14) |
| 10 | (10/31) Intro & Discussion sections<br>(11/2) Submitting your findings | Experiment conditions<br>Randomizing & balancing | Attentional blink<br>(Reading – C17-6) |
| 11 | (11/7) Peer review & publishing<br>(11/9) Running simulation studies | Recording responses<br>Debugging | Lab report #4 |
| 12 | (11/14) Formalizing theories<br>(11/16) Neuroimaging approaches | Reading code<br>Dynamic stimuli | Signal detection<br>(Reading – M13) |
| 13 | (11/21) Using neural/behavioral data<br>(11/23) NO CLASS - Thanksgiving | Example experiments | Lab report #5 |
| 14 | (11/28) Work on final projects<br>(11/30) Work on final projects | Work on final projects<br>Maybe: Latex papers? | (Reading – FW15) |
| 15 | (12/5) Data collection for final projects<br>(12/7) Data collection for final projects | Work on final projects<br><br>Work on final projects | <br><br>Final methods |
| **(12/15) 5 PM FINAL PROJECT PAPERS DUE** | | | |

**Reading Schedule:**

| Day | Citation | Title |
| --- | --- | --- |
| 8/29 (Week 1) | Newell, 1973 | You can't play 20 questions with nature and win |
| 8/31 (Week 1) | Ozgur et al, 2017 | MATLAB vs Python vs R |
| 9/7 (Week 2) | Chambers, 2017 | Chapter 1: The Sin of Bias |
| 9/14 (Week 3) | Navarro, 2021 | If mathematical psychology did not exist, we might need to invent it |
| 9/21 (Week 4) | Ehrenstein & Ehrenstein, 1999 | Psychophysical Methods |
| 9/28 (Week 5) | Chambers, 2017 | Chapter 2: The Sin of Hidden Flexibility |
| 10/5 (Week 6) | Chambers, 2017 | Chapter 3: The Sin of Unreliability |
| 10/12 (Week 7) | Wagenmakers et al, 2018 | Bayesian inference for psychology. Part I: Theoretical advantages and practical ramifications |
| 10/19 (Week 8) | Cumming, 2014 | The New Statistics: Why and How |
| 10/26 (Week 9) | Rougier et al, 2014 | Ten Simple Rules for Better Figures |
| 11/2 (Week 10) | Chambers, 2017 | Chapter 6: The Sin of Internment |
| 11/16 (Week 12) | Moran & Zaki, 2013 | Functional Neuroimaging and Psychology: What Have You Done for Me Lately? |
| 11/28 (Week 14) | Forstmann & Wagenmakers, 2015 | Model-Based Cognitive Neuroscience: A Conceptual Introduction |