

SENSORY ECOLOGY

PCB 4413

(FALL 2022)

3 Credit Hours

Department of Biology, College of Sciences

Class meeting times: 2:00 – 3:20 pm (Wed, Fri)

Location: Biology Department Room 105 (main campus)

Modality: Face to face (P)

This class is a split-level undergraduate (PCB 4413) and graduate (PCB 5416) class.

Instructor Information

Dr. William Crampton (he/him/his)

Associate Professor, Department of Biology

- <https://www.researchgate.net/profile/William-Crampton>
- <https://scholar.google.com/citations?hl=en&user=EH3KFZMAAAAJ>
- <https://sciences.ucf.edu/biology/person/will-crampton/>
- Office Location: Bio 402A
- Contact: crampton@ucf.edu

Course schedule:

Download from Webcourses: Files > Syllabus and Schedules (this may be updated through the semester as per Webcourses Announcements)

Office Hours:

Office hours: **3:30 – 5:30 pm (Wed)**. Face-to-face in **Bio 402A** (4th floor in Biological Sciences Building).

COVID-19 pandemic statement

For your safety, and for the safety of people in your community, UCF and the CDC strongly recommend that you are fully vaccinated. Please follow the latest CDC-recommended safety measures

<https://www.cdc.gov/media/releases/2022/p0811-covid-guidance.html>

See UCF Policy statements at end of this Syllabus.

Course Information

- Term: Fall 2022
- Course Number & Section: PCB 4413-001
- Class number: 89139
- Course Name: "Sensory Ecology"
- Credit Hours: 3
- Class Meeting Days: Wednesday, Friday
- Class Meeting Time: 2:00 pm - 3:20 pm
- Class Location: Bio 105.
- Course Modality: Face-to-face (P)

Enrollment Requirements

Course Prerequisites (if applicable): UCF catalog: PR: ZOO 4513 ("B" (3.0) or better) or PCB 4683 ("B" (3.0) or better).

Course Co-requisites (if applicable): Not applicable

Other Enrollment Requirements (if applicable): Not applicable

Course Description

Sensory ecology is the study of how animals acquire, process, and make use of information from the environment (including from other animals), and how sensory systems influence evolutionary change. In this class students will learn about how animals acquire and process information from receptors and organs specialized for sensing light, sound, chemicals, electric fields, magnetic fields and more. Students will learn why sensory information is useful to animals in a wide variety of terrestrial, freshwater, marine, and underground environments, and how sensory systems are adapted to different habitats and lifestyles. Finally, students will learn about how sensory systems influence key evolutionary processes.

Course Abbreviated Description

Sensory ecology is the study of how and why animals acquire, process, and use information from their environment, and how sensory systems influence evolutionary processes.

Course objectives and purpose

Animals have evolved an astonishing array of sensory receptors and organs that are essential for survival and reproduction, and that are adapted to almost every ecological niche on the planet. This class has three aims: First, it reviews how, and for what purposes animals gather and use information, and

how sensory systems and receptors work at the neurobiological, physiological, and anatomical level. Second, it examines how the form and function of sensory systems are matched to different habitats or ecosystems. Third, it explores the role of sensory systems in key evolutionary processes such as reproductive isolation. For each of these themes the class will not only discuss sensory systems that humans are familiar with (*visual, acoustic, olfactory, gustatory, tactile, vestibular, proprioception*), but also more exotic sensory systems such as *electroreception, magnetoreception, and lateral line mechanoreception*, as well as acoustic and visual systems that detect stimuli outside the range of human frequency sensitivity (ultrasound, infrasound, ultraviolet, infrared detection).

This is a lecture-based class, in which students will learn the theoretical basis of sensory ecology, as well as explore case studies and key experiments. There will be reading assignments with in-class discussions of journal articles. There will also be an interactive experiment with *live* electric fish (weakly electric gymnotiforms from South America) in which students will participate in the design, execution, and analysis of short experiments. A major goal of this class is to help students develop critical and independent scientific thinking.

Course Materials and Resources

Class website: Webcourses (<https://webcourses.ucf.edu>).

Power point lectures, demonstration worksheets, *.pdf* journal articles/book chapters, other resources, and announcements will be posted on Webcourses.

To obtain these resources go to Files > Lectures / Resources etc. in Webcourses.

There is no required textbook. For optional reading I suggest the following text. This is available for free in electronic format via the UCF library.

Martin Stevens (2013). *Sensory Ecology, Behavior, and Evolution*.

Hardware and software requirements

You will need a computer with broadband internet access. You will also need Adobe Reader, Microsoft Word (or any other word processing software), Microsoft Excel (or any other similar spreadsheet software), and an internet browser. Some or all of the graduate students in this class will be using the R programming language. You are welcome to try to use R instead of Excel when writing up your demonstration notes. However, this is not required.

Student Learning Outcomes

- Learn core concepts in sensory ecology
- Build on skills and knowledge learned from other relevant undergraduate classes
- Read and discuss key case studies and learn why and how these studies were conducted
- Learn to think critically about scientific questions and hypotheses
- Interpret graphs, figures, and basic statistics from the literature

- Understand basic experimental design and participate in scientific experiments
- Write a review paper on a chosen topic

Course Activities

Lectures: Questions are encouraged at any time. The PowerPoint slides will be posted on Webcourses *after* lectures (typically within 24 hours).

Demonstrations: Demonstrations will be conducted in the classroom during regular class times. Additional resources for the demonstrations may be posted, e.g., videos embedded in power point lectures. The expectations for each demonstration will be fully explained in class and/or by Webcourses Announcements. Please make sure you follow all announcements and obtain all posted resources.

You will be expected to fill in work sheets for each demonstration. Please follow the instructions on the worksheets (details will also be described in the lectures), fill these in and submit them all together at the end of semester (see Schedule for submission deadlines). You may append additional pages to the worksheets as you see fit.

Demonstration worksheets will be available via *Webcourses > Files > Resources > Demonstrations > Demonstration worksheets*

(Note: some demonstration worksheets will become available before the demonstration, others shortly after – as announced. Write notes on loose paper during the demonstration where I announce that the worksheets will be posted after the demonstration).

Important: Be aware that there will be questions in the exams relating to Demonstration content.

Please dress suitably for a laboratory environment. By UCF Environmental Health and Safety regulation, you must use closed shoes in Bio 105.

Term Paper: You will pick a sensory ecology-related subject of interest to you and conduct a **literature-based review**. You must not replicate your term papers with a similar assignment for another class (be aware that this is a violation of the UCF Academic Integrity rules and instructors are permitted by FERPA rules to share notes on such matters).

Term paper instructions:

1. Submit a term paper proposal comprising a *preliminary* title (maximum 20 words) and *preliminary* abstract (maximum 200 words) **for approval**. (See Schedule for submission deadlines). *Instructions for submission mode will be provided by Webcourses Announcement.*

I strongly recommend that you discuss the suitability of a potential topic with me (e.g., after class or in office hours) *before* you spend time writing your proposal title and abstract!

2. Once your title/abstract are approved. Use online/library resources to do your research. I will discuss strategies for writing your term paper and useful resources during *Demonstration 1*.
3. Type your term paper, print, and submit before the deadline (see Schedule for submission deadlines). *Instructions for submission mode will be provided by Webcourses Announcement.*

Presentation of term paper. You will present a 5-minute Power-point speed-talk on your term paper, with 3 minutes for questions. There will be *strict* time limits. The score for your talk will provide up to 5% of your final grade. If you do not present your term paper you will not receive a score for this assignment.

Term paper formatting rules:

Go to Webcourses > Files > Resources > Term paper resources for a suggested format.

- Minimum **6** Maximum **10** pages (including abstract and figures but *excluding* references and tables).
- Use 12-point Times New Roman. Single spaced.
- Arrange in the order:

Title (on cover page) – up to 3 lines long. This can be different to your preliminary title, but I will need to approve a major topic change.

Abstract (also on cover page) (150 words minimum, 250 words maximum). This can be different to your preliminary abstract (most students revise their abstract as they develop their paper).

Background.

Main text. If you like you can divide your text into headings of your own choice (with no more than 2 levels (e.g., 1., 1.1). Headings are entirely optional. If you use headings, try to avoid very short sections (e.g., comprising just 1 or 2 sentences).

Summary

References (list papers cited in the text at the end of the text).

- You are allowed up to six figures. Please embed these in text near the point at which they are first mentioned. Number them in order of first mention. Include a short legend below each one. Use color if you like. Cite sources of figures. Do not include figures of purely ornamental function. Every aspect of a figure should be correctly explained in the legend. If you include figures from papers you must cite the source and explain the relevant parts of the figures in your legend.
- You are allowed up to 4 tables. These should be placed at the end of the paper. They do not count in the page count. Format tables as you like. Do not paste in tables from other papers. Tables must involve your own analyses or interpretations.

- You are allowed an unlimited number of references. These do not count in the page count. I recommend a minimum of 15 references from peer reviewed journals.
- No appendices or other supplementary documents should be included.
- The paper should be formatted *approximately* as a scientific journal (see *example* in Term paper template)– We will discuss how to find and cite bibliographic information in class.
- Do not add extra spaces between lines/paragraphs or inflate figure/table sizes to circumvent minimum page guidelines. This will reduce your score.
- More information will be provided in class about term papers and formatting.

Activity Submission deadlines

See class Schedule

Attendance/Participation

Attendance of lectures and office hours is very strongly encouraged but non-mandatory.

All exams must be conducted on the designated day unless an excused absence is requested from Dr. Crampton.

The Undergraduate Catalog states, “Reasons for acceptable absences may include illness, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, professional conferences), military obligations, severe weather conditions, and religious holidays.”

Assessment and Grading Procedures

The table summarizes the weight distribution for each assignment.

Assignment	Percentage of Grade
Academic Assignment Quiz	1%
Exam 1	17% (short answer & multiple choice)
Exam 2	20% (short answer & multiple choice)
Term paper	20%
Notes on demonstrations	12%
Presentation	5%
Participation in class	5%
Final Exam	20% (short answer, long answer, & multiple choice)
Total	100%

Grading scale:

A: ≥ 90 - 100, **B:** $\geq 80 < 90$, **C:** $\geq 70 < 80$, **D:** $\geq 60 < 70$, **F:** < 60 .

Consult the latest Undergraduate Catalog for regulations and procedures regarding grading such as Incomplete grades, grade changes, and grade forgiveness.

Grading breakdown:

Financial Aid Quiz = 1%

Exam 1 = 17%: The exam will occur during class time. You will have the full duration of the class. Format: short answer and some multiple choice. This will not be a scantron exam.

Exam 2 = 20%: The exam will occur during class time. You will have the full duration of the class. Format: short answer and some multiple choice. This will not be a scantron exam.

Term paper = 20%. You must submit your term paper before the deadline (see Schedule for submission deadlines). *Instructions for submission mode will be provided by Webcourses Announcement.*

Notes on demonstrations = 12%. You must complete all demonstration worksheets and submit them before the deadline (see Schedule for submission deadlines). *Instructions for submission mode will be provided by Webcourses Announcement.*

Presentation = 5%. The presentation will comprise a 5-minute talk on your Term paper subject. Please make a PowerPoint presentation. You must do the presentation to gain a score for this component of your grade. Time will be limited strictly to 5 minutes.

Participation in class = 5% To score full marks you must contribute to in-class discussions – including during the lectures, during discussions of journal articles, and in demonstrations.

Final exam = 20%. To be taken at the appointed time, in the classroom. Format: multiple choice/short answers/long answers. This will not be a scantron exam.

There are no makeups for the final exam except in the case of a serious documented emergency. The final exam will be semi-cumulative. It will emphasize information in the class presented after Exam 2. It will also include questions on course content prior to Exam 2. There will be questions that draw from the Demonstrations. Details of the structure of the exam will be fully announced well ahead of the final exam itself.

“Curving” policy. “Curves” may be applied to exams 1, 2, and the final exam at my discretion. Students who achieve over 100% in Exams 1 or 2 due to curving will have those points “rolled over” to the next exam.

Extra credit: There is no extra credit in this class.

Grade round-up: If your final score (out of 100%, for all course components listed in the table above) is between greater than or equal to 89.5% your score will be upgraded to 90% – i.e., you will be upgraded from a B to an A (same for other grade boundaries). There will be no appeals for a round up if your score does not fulfil this criterion. For example, if you score 89.499% in an exam, you will *not* qualify for the round up to an A grade.

Make-up Exams and Assignments

Make-up policy: Make-up exams for Exams 1 and 2 (i.e., doing this exam on another day) can be provided, but they must be for valid reasons, and I will require documentation. If you require a make-up please contact me, in advance, to seek an excused absence, or as soon as possible after the exam in the case of an emergency. You must attend the Final Exam at the scheduled time.

Per university policy, you are allowed to submit make-up work (or an equivalent, alternate assignment) for authorized university-sponsored activities, religious observances, or legal obligations (such as jury duty). If this participation conflicts with your course assignments, I will offer a reasonable opportunity for you to complete missed assignments and/or exams. The make-up assignment and grading scale will be equivalent to the missed assignment and its grading scale. In the case of an authorized university activity, it is your responsibility to show me a signed copy of the Program Verification Form for which you will be absent, prior to the class in which the absence occurs. In any of these cases, please contact me ahead of time to notify me of upcoming needs.

Correspondences

Communication: All e-mail correspondence should be via UCF email addresses or through Webcourses. **By FERPA regulation emails from third-party email addresses cannot be responded to.** Please place the course number and a brief subject description in the email title line. Please make sure you put your full name at the end of the email.

Please do not use my office telephone or voice mail for correspondence. I am only infrequently in my office, and I do not check my voicemail as frequently as my email. You will get a much more rapid response by email!

Class policy changes

I reserve the right to change the syllabus and class schedule. These changes will be announced in lectures and via Webcourses.

Academic engagement quiz

All instructors/faculty are required to document student academic activity at the beginning of each course. In order to document that you began this course, please complete the quiz labeled 'Academic Engagement Quiz (under Quizzes)' by the end of the first week of classes or as soon as possible after adding the course. Failure to do so may result in a delay in the disbursement of your financial aid.

University Services and Resources

Academic Services and Resources

A list of available academic support and learning services is available at [UCF Student ServicesLinks to an external site.](#). Click on "Academic Support and Learning Services" on the right-hand side to filter.

Non-Academic Services and Resources

A list of non-academic support and services is also available at [UCF Student ServicesLinks to an external site.](#). Click on "Support" on the right-hand side to filter.

If you are a UCF Online student, please consult the [UCF Online Student GuidelinesLinks to an external site.](#) for more information about your access to non-academic services.

Policy Statements

UCF Statement: Covid 19 and illness notification

See latest COVID-19 statement at the link below, and please follow all updates to official university policy.

<https://www.ucf.edu/coronavirus/covid-19-updates-the-next-phase/>

UCF statement: accessibility and disability

Accommodations may need to be added or adjusted should this course shift from an on-campus to a remote format. Students with disabilities should speak with their instructor and should contact sas@ucf.edu to discuss specific accommodations for this or other courses.

UCF statement on in-class recordings

Students may, without prior notice, record video or audio of a class lecture for a class in which the student is enrolled for their own personal educational use. A class lecture is defined as a formal or methodical oral presentation as part of a university course intended to present information or teach students about a particular subject. Recording classroom activities other than class lectures, including but not limited to lab sessions, student presentations (whether individually or part of a group), class discussion (except when incidental to and incorporated within a class lecture), clinical presentations such as patient history, academic exercises involving student participation, test or examination administrations, field trips, and private conversations is prohibited. Recordings may not be used as a substitute for class participation and class attendance and may not be published or shared without the written consent of the faculty member. Failure to adhere to these requirements may constitute a violation of the University's Student Code of Conduct as described in the Golden Rule.

Academic Integrity

Students should familiarize themselves with UCF's [Rules of Conduct \(Links to an external site\)](#). According to Section 1, "Academic Misconduct," students are prohibited from engaging in:

- *Unauthorized assistance*: Using or attempting to use unauthorized materials, information or study aids in any academic exercise unless specifically authorized by the instructor of record. The unauthorized possession of examination or course-related material also constitutes cheating.
- *Communication to another through written, visual, electronic, or oral means*: The presentation of material which has not been studied or learned, but rather was obtained through someone else's efforts and used as part of an examination, course assignment, or project.
- *Commercial Use of Academic Material*: Selling of course material to another person, student, and/or uploading course material to a third-party vendor without authorization or without the express written permission of the university and the instructor. Course materials include but are not limited to class notes, Instructor's PowerPoints, course syllabi, tests, quizzes, labs, instruction sheets, homework, study guides, handouts, etc.
- *Falsifying or misrepresenting* the student's own academic work.
- *Plagiarism*: Using or appropriating another's work without any indication of the source, thereby attempting to convey the impression that such work is the student's own.
- *Multiple Submissions*: Submitting the same academic work for credit more than once without the express written permission of the instructor.
- *Helping another violate* academic behavior standards.

For more information about Academic Integrity, students may consult [The Center for Academic Integrity \(Links to an external site\)](#).

For more information about plagiarism and misuse of sources, see "[Defining and Avoiding Plagiarism: The WPA Statement on Best Practices \(Links to an external site\)](#)".

Responses to Academic Dishonesty, Plagiarism, or Cheating

Students should also familiarize themselves with the procedures for academic misconduct in UCF's student handbook, [The Golden Rule \(Links to an external site\)](#). UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and when necessary respond to academic misconduct. Penalties can include a failing grade in an assignment or in the course, suspension, or expulsion from the university, and/or a "Z Designation" on a student's official transcript indicating academic dishonesty, where the final grade for this course will be preceded by the letter Z. For more information about the Z Designation, see <http://goldenrule.sdes.ucf.edu/zgrade> ([Links to an external site](#)).

Course Accessibility Statement

The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who need disability-related access in this course should contact the professor as soon as possible. Students should also connect with [Student Accessibility Services \(Links to an external site.\)](#) (Ferrell Commons 185, sas@ucf.edu, phone (407) 823-2371). Through Student Accessibility Services, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential access and accommodations that might be reasonable. Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student.

Deployed Active-Duty Military Students

Students who are deployed active-duty military and/or National Guard personnel and require accommodation should contact their instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make related arrangements.

Copyright

This course may contain copyright protected materials such as audio or video clips, images, text materials, etc. These items are being used with regard to the Fair Use doctrine in order to enhance the learning environment. Please do not copy, duplicate, download or distribute these items. The use of these materials is strictly reserved for this online classroom environment and your use only. All copyright materials are credited to the copyright holder.

Third-Party Software and FERPA

During this course you might have the opportunity to use public online services and/or software applications sometimes called third-party software such as a blog or wiki. While some of these could be required assignments, you need not make any personally identifying information on a public site. Do not post or provide any private information about yourself or your classmates. Where appropriate you may use a pseudonym or nickname. Some written assignments posted publicly may require personal reflection/comments, but the assignments will not require you to disclose any personally identity-sensitive information. If you have any concerns about this, please contact your instructor.

Statement of diversity and inclusion

All participants in this class are expected to abide by the following statement, in the UCF Golden Rule: “UCF values diversity and inclusion of all in our community. Accordingly, discrimination on the basis of race, sex, national origin, religion, age, disability, marital status, or veteran’s status is prohibited by federal and/or state law. It is our policy to treat all people with dignity and respect, without regard to race, creed, color, national origin, religion, sex, age, disability, marital status, sexual orientation, gender expression, gender identity, veteran status, or political opinions and affiliations.”

Campus safety statement

Emergencies on campus are rare, but if one should arise in our class, we will all need to work together. Everyone should be aware of the surroundings and familiar with some basic safety and security concepts.

- In case of an emergency, dial 911 for assistance.
- Every UCF classroom contains an emergency procedure guide posted on a wall near the door. Please make a note of the guide's physical location and consider reviewing the online version at http://emergency.ucf.edu/emergency_guide.html.
- Familiarize yourself with evacuation routes from each of your classrooms and have a plan for finding safety in case of an emergency.
- If there is a medical emergency during class, we may need to access a first aid kit or AED (Automated External Defibrillator). To learn where those items are located in this building, see <http://www.ehs.ucf.edu/AEDlocations-UCF> (click on link from menu on left).
- To stay informed about emergency situations, sign up to receive UCF text alerts by going to my.ucf.edu and logging in. Click on "Student Self Service" located on the left side of the screen in the tool bar, scroll down to the blue "Personal Information" heading on your Student Center screen, click on "UCF Alert", fill out the information, including your e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."
- If you have a special need related to emergency situations, please speak with me during office hours.
- Consider viewing this video (<https://youtu.be/NIKYajEx4pk>) about how to manage an active shooter situation on campus or elsewhere.