

# VISUAL ECOLOGY

*Fall 2021* | *University of Florida*

Welcome to Visual Ecology! In this course, we will study how and why animals detect visual signals, learn about the nature of light as it relates to animal communication and visual perception, discover how eyes evolved, and more. We will practice and hone what we've learned by discussing scientific papers and defending mock research project proposals related to visual ecology.



Image by Lenka Novotná from <https://pixabay.com>

## COURSE INFORMATION

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**Course number:** ZOO 4926 Special Topics

**Credit hours:** 3

**Class meetings:** online via Zoom T 3-3:50,  
Th 3-4:55

**Instructor:** Dr. Melissa Meadows

**Email:** [Melissa.Meadows@ufl.edu](mailto:Melissa.Meadows@ufl.edu)

**Zoom Office:**  
<https://ufl.zoom.us/j/3066712046>

**Office Hours:** T 4-5, W 3-5 BY  
APPOINTMENT

**Make an appointment:**  
<https://tinyurl.com/yxnky196>

# WHAT WILL I NEED?

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**Textbook:** Visual Ecology by T. Cronin, S. Johnsen, N. J. Marshall, and E. Warrant. 2014. Princeton University Press: Princeton NJ. ISBN: 978-0-691-15184-7

**E-learning/ Canvas:** All reading materials, announcements, assignments, and other materials will be available on the e-Learning site for this course. Please make sure that you are enrolled on the site, and set notifications to come to you in whatever way is convenient (text, email, etc.) so that you receive them in a timely manner.

**Mindset:** Come to class ready to think critically and discuss the assigned reading. Unlike many classes, it is vital to read the assigned textbook chapters BEFORE coming to class each day so that we can use classtime to check and enhance your understanding of advanced concepts.

# WHAT WILL I LEARN?

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Visual ecology can be broadly defined as the study of how visual systems function to meet the ecological needs of animals, how they have evolved for proper function, and how they are specialized for and involved in particular visual tasks.

## Learning Objectives:

1. Explain the evolution of eyes.
2. Discuss the measurement of light and the various types of light environments encountered by animals.
3. Describe the building blocks of eyes including photoreceptors, optical components, and how this varies in different types of eyes across the animal kingdom.
4. Explain how eyes are used for spatial tasks and how (some) detect color and/or polarization of light.
5. Discuss how vision is impacted by attenuating media such as water and by dim light.
6. Understand the concept of optic flow and how it is used in motion vision.
7. Explain how animals can use visual signals for orientation and navigation.
8. Discuss the production and functions of animal coloration and patterns.

# HOW WILL MY LEARNING BE ASSESSED?

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## Grading Scale

Please note that grades will not be rounded. For example 89.99% is a B+ rather than an A-. Grades will be based upon a variety of activities as described in the next section.

<b>A</b>	<b>A-</b>	<b>B+</b>	<b>B</b>	<b>B-</b>	<b>C+</b>	<b>C</b>	<b>C-</b>	<b>D+</b>	<b>D</b>	<b>D-</b>	<b>E</b>
≥93%	≥90%	≥87%	≥83%	≥80%	≥77%	≥73%	≥70%	≥67%	≥63%	≥60%	<60%

## Grade Weighting

Grades will be weighted as follows:

**40% Exams** (3 non-cumulative exams)

**20% Mock Research Proposal** on a topic that interests you.

**15% Scientific Paper Discussion** that you will lead on a paper of your choosing.

**15% Assignments** such as short papers, chapter questions, etc.

**10% Participation** in discussions at each class meeting, including scientific paper discussions.

## Assessment Details

**Exams:** We will have 3 exams during the semester (see schedule). The exams will involve mainly essay or short answer questions about the material we have covered. In case you must miss an exam, a formal excuse (e.g., note from doctor or email from the Dean of Students office at <https://care.dso.ufl.edu/instructor-notifications/>) must be provided and make-ups will be handled on a case-by-case basis.

**Mock study proposal:** So, you want to become a visual ecologist? First, you must design an interesting and innovative study, and most importantly, get funding for it! At the end of the semester, each student will deliver a PowerPoint presentation to the group outlining a study of the student's design. This should be a fun and creative way to put what you've learned during the semester to work and to think about your research interests. We will discuss much more about this later.

**Scientific paper discussion:** Each student will pick a recent paper from the primary scientific literature to discuss with the class. The student will begin by

delivering a short presentation about the paper and its major findings and will then lead a discussion about the paper with the class. Everyone must also participate actively in discussions. We will assign topics and dates for discussions soon.

**Assignments:** We will have a variety of small assignments throughout the semester such as short writing assignments, chapter questions, etc.

**Participation:** Participation points will be assigned based on active participation in class discussions and activities, attendance at every class meeting (unless excused), and especially participation in scientific paper discussions and mock research proposal Q&A.

## WHAT CLASS POLICIES MUST I FOLLOW?

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**Attendance** is important, especially in this course which will be very discussion-based. Be sure to attend every class meeting. The material on which you will be tested may not all appear in written form in the PowerPoint slides and may be based on discussions held in class. Important announcements about assignments, due dates, and changes to the syllabus may be made in class. If you must miss class for some reason, please let Dr. Meadows know ahead of time if possible.

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. University policies are available at <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

**Questions or Concerns:** If you have any sort of questions or concerns about any matters related to the course, your grades, or your understanding of the material, please bring these to your instructors' attention as soon as possible. For grade concerns, please see your instructor within a week of the specific grade's posting.

**Conduct in class:** PARTICIPATE. Ask questions. Connect. Bring your computer, but don't use it for non-class activities. Be respectful. Silence your phone. Don't do anything that distracts your neighbors' learning or your instructor's teaching.

**Diversity:** We need diversity of opinion, social class, culture, religion, sexual orientation, gender, race, ethnicity, and ability in science. Enjoy the diverse scientists you learn about. Ask why diversity is lacking. Always maintain an environment of respect and inclusion. Listen and learn from all.

**Time commitment:** The university policy is that students should expect to spend 3-4 hours per week per credit hour studying, reading, and completing assignments, and participating in class. This is a 3 credit course, so budget 9-12 hours per week to succeed. Do not procrastinate.

**Recording:** Class sessions on Zoom will be recorded. Therefore, if you speak during class your voice and image may be recorded. Recordings will NOT be available publicly and will only be available to members of this course.

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.

**Academic dishonesty** including plagiarism (using another person’s ideas, words, materials, or work without properly acknowledging that external source) and cheating will not be tolerated. Academic dishonesty may result in, at the least, a zero on the assignment AND a drop by one letter of the final grade.

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. Read the conduct code at <https://sccr.dso.ufl.edu/process/student-conduct-code/>. If you have any questions or concerns, please consult with the instructor.

## WHAT IF I NEED ACCOMMODATION?

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Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. Get started with the DRC here: <https://disability.ufl.edu/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

## WHAT IF I NEED HELP?

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### **Come visit!**

Make an appointment for Zoom Office Hours - you’ll get to reserve me all for yourself. :) Make an appointment: <http://TinyURL.com/yxnkyl96>. Email for an appointment at another time.

### **Technical Difficulties**

Please contact the UF Help Desk at: <http://helpdesk.ufl.edu>. Call (352) 392-HELP (4357) Walk-in: HUB 132

Any requests for make-ups due to technical issues should be accompanied by the ticket number received from the Help Desk when the problem was reported to them. The ticket number will document the time and date of the problem. You

should e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

## **Health and Wellness**

**U Matter, We Care:** ASKING FOR HELP IS A SIGN OF STRENGTH. We are living through historical difficulty. If you or a friend is in distress, contact If you or someone you know is in distress, please contact [umatter@ufl.edu](mailto:umatter@ufl.edu), 352-392-1575, or visit <http://umatter.ufl.edu> to refer or report a concern and a team member will reach out to the student in distress.

**Counseling and Wellness Center:** Visit <http://counseling.ufl.edu> or call 352-392-1575 for information on crisis services as well as non-crisis services.

**Field and Fork Campus Food Pantry:** <https://pantry.fieldandfork.ufl.edu>

**Student Health Care Center:** Call 352-392-1161 for 24/7 information to help you find the care you need, or visit <http://shcc.ufl.edu>

**University Police Department:** Visit <http://police.ufl.edu> or call 352-392-1111 (or 9-1-1 for emergencies).

**UF Health Shands Emergency Room/Trauma Center:** For immediate medical care in Gainesville, call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; <http://ufhealth.org/emergency-room-trauma-center>

## **Academic and Student Support**

**Career Connections Center:** 352-392-1601. Career assistance and counseling <https://career.ufl.edu/>

**Library Support:** Various ways to receive assistance with respect to using the libraries or finding resources. <http://cms.uflib.ufl.edu/ask>

**Teaching Center:** 352-392-2010 General study skills and tutoring: <http://teachingcenter.ufl.edu>

**Writing Studio:** 352-846-1138. Help brainstorming, formatting, and writing papers: <http://writing.ufl.edu/writing-studio/>

# COURSE EVALUATIONS

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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/>

## TIPS FOR SUCCESS

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Taking a course online can be a lot of fun! Here are some tips that will help you get the most of this course while taking full advantage of the online format:

**Attend and participate:** Studies show that the more you discuss, draw, analyze, and actively participate in class, the more you learn!

**Read:** Read assigned reading before lecture each week. Then use lectures to hone understanding and apply your knowledge.

**Take notes:** Do not be a passive listener! Take active notes while watching lectures, especially on questions asked in the lecture.

**Ask questions:** Ask immediately. Don't be afraid to ask me to meet and go over something again! Chances are, others need a clarification, too (which I can post as an announcement).

**Use your resources:** Use this syllabus to answer questions about the course and locate help when you need it. Use Canvas. Use the Study Room discussions. Use books.

**Plan ahead:** Plan 9-12 hrs/wk, including 3 hrs for lecture and discussion, and 6-9 hrs on reading, assignments, and studying. Don't start studying or projects at the last minute.

**Study effectively:** Visit <http://learningscientists.org/videos> to learn the 6 strategies for effective learning. Guess what the first one is? NO CRAMMING!



**I care:** I am deeply invested in YOU and your happiness and success. Email me, make an appointment for office hours, etc. to go over course material, talk about life, or just say hi!

# SCHEDULE

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<b>Week of</b>		<b>Topic</b>
<b>8/23</b>	Tues	Course Introduction
	Thurs	Ch 1: Introduction
<b>8/30</b>	Tues	Ch 2: Light and the Optical Environment
	Thurs	(Ch 2 continued)
<b>9/6</b>	Tues	Ch 3: Visual Pigments and Photoreceptors
	Thurs	Paper 1
<b>9/13</b>	Tues	Ch 4: The Optical Building Blocks of Eyes
	Thurs	Paper 2
<b>9/20</b>	Tues	<b>EXAM 1</b>
	Thurs	Ch 5: The Eye Designs of the Animal Kingdom
<b>9/27</b>	Tues	Ch 6: Spatial Vision
	Thurs	Paper 3
<b>10/4</b>	Tues	Ch 7: Color Vision
	Thurs	Paper 4
<b>10/11</b>	Tues	Ch 8: Polarization Vision
	Thurs	Paper 5
<b>10/18</b>	Tues	<b>EXAM 2</b>
	Thurs	Ch 9: Vision in Attenuating Media
<b>10/25</b>	Tues	Ch 10: Motion Vision and Eye Movement
	Thurs	Paper 6
<b>11/1</b>	Tues	Ch 11: Vision in Dim Light
	Thurs	Paper 7
<b>11/8</b>	Tues	Ch 12: Visual Orientation and Navigation
	Thurs	Paper 8
<b>11/15</b>	Tues	Ch 13: Signals and Camouflage
	Thurs	Paper 9
<b>11/22</b>	Tues	FALL BREAK

	Thurs	FALL BREAK
<b>11/29</b>	Tues	Mock Research Proposals
	Thurs	Paper 10
<b>12/6</b>	Tues	<b>EXAM 3</b>



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