

## Course Title

### **ANS 6040 Concepts in Applied Ethology (3 credits)**

## Time and Location

- Synchronous class sessions held via Zoom on Tuesdays from 8:30 – 11:30 (periods 2 – 4), according to the class schedule (Page 5-6 of this Syllabus).
- In-person meetings TBD

## Course Instructor and Office Hours

### **Emily Miller-Cushon, Ph.D.**

Office: Animal Sciences – Bldg 499, Room 104E

Email: emillerc@ufl.edu

Phone: (352) 448-3748

I will hold weekly office hours via Zoom (time TBD, will poll for availability). Office hours are time I have specifically set aside to meet with students about any questions, so please join if you'd like to talk. You may need to briefly wait before joining if I am already talking with another student. You are also welcome to reach out via email or Canvas to schedule another time to meet.

## Course Description and Objectives

This course introduces concepts and methods used to conduct research in the field of applied ethology. Course content includes an overview of mechanisms of animal behavior and approaches to measuring and modeling animal behavior. The focus is on developing skills necessary to conduct, analyze, and interpret research in applied ethology.

Upon completion of this course, students will be able to:

- Understand basic concepts in the field of applied ethology through discussion of both classic literature and current topics
- Explain and utilize principles of behavior science methodology, such as approaches to experimental design and methods of collecting behavioral data
- Critically analyze journal articles, provide clearly articulated peer review, and effectively communicate ideas in class discussions
- Apply concepts in applied ethology to interdisciplinary problems such as an animal welfare assessment
- Integrate principles covered in class in the development of a conceptual model for a behavior of interest

## CLASS STRUCTURE

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*Course Website on Canvas:* Our course website can be found through login to Canvas (<http://elearning.ufl.edu>). I will use Canvas as the primary means to contact with you any important announcements. Grades and assignment feedback will also be made available to you. Resources, including the course syllabus, assigned and recommended readings, supplementary references, and lesson material, will be posted in Canvas. The lesson material (slides presented in class, as well as other related material) will be organized by topic within modules.

If you are not yet familiar with using CANVAS, please look at the Canvas ‘Getting Started’ Guide: [guides.instructure.com/m/8470](https://guides.instructure.com/m/8470). To make sure you are not missing any announcement, please make sure your CANVAS settings are adjusted as follows:

- Go to your general **Canvas Settings** (upper right corner within CANVAS) > **Notifications** (left menu bar) > **Notification Preferences**: here set to **“ASAP”** for (at least) Announcements.

*Lectures and course content:* Class will be held via Zoom. Access Zoom meetings via the ‘Zoom conferencing’ tab in Canvas. See here for instructions on how to set-up Zoom through UF: <https://video.ufl.edu/conferencing/zoom/>

Many topics in the class will be explored through in-class discussion and activities related to assigned readings. We will both discuss together as a group and have subgroups focus and present on various topics within the context of class discussions. Certain topics will be presented with the aid of PowerPoint slides, images, and short video clips.

Each topic module links to a discussion thread, where you may post any comments or questions related to the content. I will be monitoring this thread and posting replies, and you are also welcome and encouraged to respond to your classmates’ comments. Participation in class discussion boards will contribute to your ‘Class Participation’ grade, as described below.

### *Communication Expectations and Guidelines*

Please reach out via Canvas inbox with any questions or to schedule a virtual face-to-face meeting. We also encourage you to post questions relating to the lecture material in the corresponding discussion thread to also benefit others who may have the same question.

Please review our course policy on a few topics important for this online course, including online security, written communication guidelines, communication with class instructor and TA, discussion board etiquette, and synchronous class etiquette:

<https://ufl.instructure.com/courses/422015/pages/communication-expectations-and-guidelines>

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### *Textbook and required reading:*

No formal textbook is required, but the following is recommended as a useful reference and will be referred to throughout the semester:

Martin, P. and P. Bateson. (2007) *Measuring Behaviour: An Introductory Guide*. 3<sup>rd</sup> Edition. Cambridge University Press.

Key articles, including classic papers and review articles, will be used as a basis for classroom discussion on important topics. Assigned readings will be made available electronically. We will discuss the following readings on dates as follows:

- January 19** Duncan, I. J. H. 1995. An applied ethologist looks at the question “Why?” *Applied Animal Behaviour Science*. 44:205-217.  
Manning, A., and M. S. Dawkins. 1992. *An Introduction to Animal Behaviour*, 4th Ed., Cambridge University Press, UK (Questions about animal behaviour, pp. 11-16)
- March 16** Lehner, P. N. 1996. *Handbook of ethological methods*, 2nd Ed., Cambridge University Press. (A conceptual model of animal behavior, pp. 19-27, 37-45)  
Hughes, B. O., and I. J. H. Duncan. 1988. The notion of ethological ‘need’, models of motivation and animal welfare. 1988. *Animal Behavior*. 36:1696-1707.
- March 23** Fraser, D. 2009. Assessing animal welfare: Different philosophies, different scientific approaches. *Zoo Biology*. 28:507-518.  
Ede, et al. 2019. Scientific assessment of affective states in dairy cattle. *J. Dairy Sci*. 102:10677-10694.

In addition to the core readings I will assign reading of a number of peer-reviewed journal articles. These will illustrate different examples of behavioral methods that we will explore in class activities and discussion. The following list is a subset of articles that will be read prior to class discussions to serve as an example of what to expect:

- Rioja-Lang, F. C., D. J. Roberts, S. D. Healy, A. B. Lawrence, and M. J. Haskell. 2012. Dairy cows trade-off feed quality with proximity to a dominant individual in Y-maze choice tests. *J. Dairy Sci*. 117:159-164.
- Gaskill, B. N., S. A. Rohr, E. A. Pajor, J. R. Lucas, J. P. Garner. 2009. Some like it hot: Mouse temperature preferences in laboratory housing. *Applied Animal Behavior Science*. 116:279-285.
- Gaillard, C., R. K. Meagher, M. A. G. von Keyserlingk, D. M. Weary. 2014. Social housing improves dairy calves’ performance in two cognitive tests. *Plos One*. 9:1-6.
- Bailoo, J. D., E. Murphy, J. A. Varholick, J. Novak, R. Palme, and H. Wurbel. 2018. Evaluation of the effects of space allowance on measures of animal welfare in laboratory mice. *Scientific Reports*. 8:713.

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In addition to the core readings, this course will require you to read extensively on a behavior topic of your choosing and select journal articles.

### ASSIGNMENTS AND GRADING

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All activities will be graded according to rubrics posted on CANVAS. The final grade in the course will be assigned based on numeric average, as described below.

#### Marking scheme:

<b>A</b>	93-100%	<b>B+</b>	87-89.9%	<b>C+</b>	77-79.9%	<b>D+</b>	67-69.9%	<b>E</b>	< 60%
<b>A-</b>	90-92.9%	<b>B</b>	83-86.9%	<b>C</b>	73-76.9%	<b>D</b>	63-66.9%		
		<b>B-</b>	80-82.9%	<b>C-</b>	70-72.9%	<b>D-</b>	60-62.9%		

For information on current UF policies for assigning grade points, see

<https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

<b>Activity</b>	<b>Percentage of final grade</b>
Assignment 1: Asking questions about behavior <i>Oral presentation on Jan 26 or Feb 2</i> <i>Written report due Feb 9</i>	<b>20%</b>
Assignment 2: Answering questions about behavior <i>Oral presentation on Feb 23 or Mar 2</i> <i>Written report due Mar 10</i>	<b>20%</b>
Assignment 3: Animal welfare case study and journal discussion <i>Journal discussion on Apr 7</i> <i>Written summary due Apr 14</i>	<b>15%</b>
Assignment 4: Modeling a behavioral system <i>Oral presentation on 21</i> <i>Written summary due Apr 30</i>	<b>35%</b>
Class participation	<b>10%</b>

**Assignments:** There will be four assignments throughout the term. Three assignments will involve both a written paper and an oral presentation, and one assignment will be a student-led journal discussion. These assignments are described in detail in the following pages of this syllabus. Specific instructions for each assignment and the journal discussion will be discussed in detail in class well in advance of the due date, and numeric rubrics will be shared.

**Participation:** The grade for participation will be determined based on 1) completion of peer-review requirements (providing feedback for classmates' literature reviews and oral presentations) and 2) class attendance and involvement in activities and discussions (during class sessions and/or on Canvas), according to the rubric posted on Canvas. To achieve a good grade for classroom involvement you should plan to come to class familiar with any assigned

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reading and prepared to discuss your thoughts. Involvement from all students is a critical component to achieving a well-balanced and productive discussion. On presentation days, be attentive to the other speakers and contribute questions. A temporary participation grade will be posted around midsemester to provide preliminary feedback in a timeframe where you are able to improve your grade if desired.

### *Absences, Make-up Work, and Late Assignments:*

Please speak with me as soon as possible if you know you will be absent on a presentation day, as we will attempt to reschedule you. Classroom participation is expected and encouraged and regular attendance of lectures is required to obtain a good participation grade.

It is expected that all written assignments will be received on or before the stated deadline. Please note that if you miss an assignment deadline without an approved reason, I will accept the assignment but will deduct 20 % from your grade for every day that the assignment is late.

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/UGRD/academic-regulations/attendance-policies/>

### CLASS SCHEDULE

Please note that this schedule is subject to change as we move through the term. Any significant changes will be discussed in class in advance of the lecture. Class dates are color-coded by the Module that they are grouped under: ‘Asking questions about animal behavior’ is **yellow**, ‘Answering questions about animal behavior’ is **green**, ‘Modeling animal behavior’ is **blue** and ‘Animal welfare and ethics’ is **orange**.

<b>Week</b>	<b>Class date</b>	<b>Class topic</b>	<b>Deadlines</b>
1	Jan 12	Introduction to animal behavior Why do we study animal behavior?	
2	Jan 19	Asking questions about behavior - Activity: student behavior topics - Discussion of assigned reading: Tinbergen’s questions	
3	Jan 26	Assignment 1 – Student presentations and discussion	
4	Feb 2	Assignment 1 – Student presentations and discussion	
5	Feb 9	Answering questions about behavior - Measuring behavior, experimental design - Activity: Designing an ethogram	<b>Assignment 1 written report</b>
6	Feb 16	Answering questions about behavior cont. - Measuring social behavior, designing choice tests - Activity based on reading: Choice test methods	
7	Feb 23	Assignment 2 – Student presentations and discussion	
8	Mar 2	Assignment 2 – Student presentations and discussion	
9	Mar 9	Learning and motivation - Discussion: Assessing motivation	<b>Assignment 2 written report</b>

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10	Mar 16	Conceptual models of behavior - <i>Discussion of assigned reading</i>	
11	Mar 23	Behavior and animal welfare - <i>Discussion of assigned reading: Assessing affective state</i>	
12	Mar 30	<b>Assignment 3 journal discussion:</b> <i>Current topics and methods in animal welfare science</i>	
13	Apr 6	Ethics in research - Guest speakers from USDA Animal Welfare Information Center to discuss animal use in research	<b>Assignment 3 written summary</b>
14	Apr 13	<i>Assignment 4 – Student presentations and discussion</i>	
15	Apr 20	<i>Assignment 4 – Student presentations and discussion</i>	

### *Technology requirements and privacy*

Lectures during our synchronous class sessions may be audio visually recorded for students in the class to refer back to, and for students who are unable to attend live. Students who participate 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. Discussion during breakout rooms will also not be recorded. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

Computer requirements for this course are consistent with UF policy for student computing requirements, and likely similar to your other classes: <https://it.ufl.edu/policies/student-computing-requirements/>

Recorded content will be shared using **Microsoft Stream**. The first time you access the video, you will need to login to your Microsoft Stream account using your UF username and password.

This course uses **Canvas** for providing course content. Please see the links below for important information regarding privacy and accessibility of these tools:

Canvas (Infrastructure) privacy policy: <https://www.instructure.com/policies/privacy>

Canvas (Infrastructure) accessibility statement:  
<https://www.instructure.com/canvas/accessibility>

### *Academic Honesty*

As a student at the University of Florida, you have committed yourself to uphold the

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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, please see: <http://www.dso.ufl.edu/sccr/process/student-conduct-honor-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.

### *Campus Helping Resources*

Students experiencing crises or personal problems that interfere with their general well-being 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.

### *Health and 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 so that a team member can reach out to the student.

Counseling and Wellness Center:

<http://www.counseling.ufl.edu/cwc/Default.aspx>, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

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University Police Department, 392-1111 (or 9-1-1 for emergencies).  
<http://www.police.ufl.edu/>

### *Academic Resources*

Career Resource Center, Reitz Union, 392-1601. Career assistance and counseling.  
<http://www.crc.ufl.edu/>

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the 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 writing papers. <http://writing.ufl.edu/writing-studio/>

Student Complaints Campus:

[https://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf)

### *Services for Students with Disabilities*

Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)) 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.

### *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>.



**ASSIGNMENT 1 - Asking questions about animal behavior**

This assignment will focus on developing questions about animal behavior. As background for this assignment, review in-class discussion and assigned reading on Tinbergen's questions about animal behavior.

- Choose a behavior topic that is relevant to your research or of interest to you
- Select four peer-reviewed journal articles related to your behavior of interest, which each utilize a different approach (addressing each of Tinbergen's questions)

**Written assignment (80% of assignment grade)**

For each paper, provide the full reference and write a short paragraph describing the study. Answer the following questions:

- What is the research problem?
- What is the research question?
- What is the background and justification for the research question, or how was it developed?
- What approach is used in the study, and how is it used?
- Why do you think this approach was used? How does it contribute to our understanding of the behavior?

**Oral presentation (20% of assignment grade)**

Prepare a 15 minute class presentation (PowerPoint optional).

Describe the behavior topic that you have chosen: who, what, when, where? What is the applied context of the behavior, or why is it of interest in industry or captive environments?

For one of the papers you selected for the written assignment, share your answers to the questions with the class.

*The detailed assignment description and grading rubric are posted on Canvas.*

**Oral presentations will be during class on January 26 or February 2.**

**Written assignment is due on February 9.**

## **ASSIGNMENT 2 – Answering questions about animal behavior**

This assignment will focus on experimental design and approaches to studying and measuring behavior.

### **Written assignment (80% of assignment grade)**

You will be assigned two papers. For each paper, answer the following questions:

- What are the objectives and hypotheses?
- Is this study observational or experimental?
- What are the independent variables?
  - Was natural variation used or were the variables artificially manipulated?
  - How were the variables manipulated?
- What are the dependent variables?
  - What were the measurable units?
  - Were the measurable units well defined?
  - How were those units expressed in the results?
- Was there any confounding of variables or were there nuisance variables?
  - Where those variables considered? How were they dealt with?
  - Do you think they affected the internal or external validity of the study?
- What was the experimental design (e.g. one factor, two factor, repeated measure)?
  - What was the experimental unit?
  - What were the sample sizes?
- What sampling methods were used for behavioral data?
  - Were there any limitations to the sampling method chosen?
- Did the experimental design and data collection methods allow testing of the hypotheses, and were the objectives met?
- What do you think were the weaknesses of the experiment?
- How would you improve the experimental design or data collection?

### **Oral presentation (20% of assignment grade)**

For one of the papers you are writing about, prepare a 20 minute class presentation (PowerPoint optional).

Provide a brief overview of the topic covered in the paper, and describe the materials and methods. Share your answers to the assignment questions with the class.

*The detailed assignment description and grading rubric are posted on Canvas.*

**Oral presentations will be during class on February 23 or March 2.**

**Written assignment is due on March 9.**

### **ASSIGNMENT 3 – Animal welfare journal discussion and reflection**

The goal of this assignment is to learn about current topics in animal welfare and research methods in applied ethology to address these topics. We will gain experience thinking critically and discussing our ideas during in-class discussions of some current papers.

#### **Journal discussion (60% of assignment grade)**

You will work in groups of 2-3 to lead a class discussion surrounding a peer reviewed journal article, which focuses on a current important animal welfare topic (paper published in the last 5 years) and employs a behavioral approach to address it. For example, the experiment may evaluate behavioral indicators of welfare, or approaches to improve welfare by drawing on what is known about behavior. I will post a list of papers that you may choose from, or you may find a different paper on your own. The class will read all selected papers prior to the discussion date, so that everyone can participate.

For your discussion, work together to prepare discussion points and questions to engage the class. Begin your discussion by introducing your paper topic: why is this topic currently relevant? Consider reading beyond your manuscript to obtain a general grasp of your topic. What is the welfare issue, and how does it relate to our definition of animal welfare?

Next, ask the class questions which generate discussion and student involvement – this is an informal ‘round table’ discussion. Here are some ideas of questions to consider asking:

- What methods were used to measure animal behavior, and how did they relate to assessing animal welfare?
- How can conclusions drawn from this study be applied to improve animal welfare?
- What are study limitations and critiques of the experimental design?
- Discuss ethics of animal use in this study: were any of the study procedures likely to impair welfare? Was animal use approval stated?

You should expect your paper discussion to last 30-40 minutes. You might not have time to use all prepared questions, so you should prioritize them and organize yourself as a group ahead of time. All group members should be involved in leading the group discussion, so you may want to plan to take turns asking questions. Your grade will depend on the quality of the discussion points you have prepared for class, and preparedness in guiding the class through the discussion.

#### **Written summary (40% of assignment grade)**

Individually prepare a 1 page summary of the discussion, including a brief overview of the paper and description of the welfare issue it addresses, key aspects of the paper discussed in class, and your reflections on some of these main points.

*The detailed assignment description and grading rubric are posted on Canvas.*

**Journal discussions will be on March 30. Written summary is due on April 6.**

#### **ASSIGNMENT 4 – Modeling a behavioral system**

This assignment will combine what you have learned about asking and answering questions about behavior in the development of a conceptual model and experiment for a behavior topic of interest. Your assignment will consist of: a review of the literature concerning your behavior topic, a conceptual model of your behavior, and a proposal for an experiment.

#### **Written assignment (80% of assignment grade)**

- Prepare a review of the scientific literature concerning your behavior topic.
  - What do we know about why, when, and how it occurs?
  - Discuss internal mechanisms and external stimuli that elicit the behavior, as well as other factors which influence it (e.g. genetic effects, development). What are the consequences of the behavior?
  - The content and focus of your literature review will depend on your particular behavior topic.
  - Your literature review draft may be submitted for feedback by April 4
- After completing your literature review, incorporate information you have collected into a visual representation of what we know about the causation of the behavior.
  - Refer to conceptual models discussed in class as well as assigned reading. You may either adapt an existing model or develop an original model to suit your behavior topic.
- Identify gaps in our knowledge about the behavior and develop and discuss 3-4 questions that remain to be answered.
- Choose one of the questions you have identified and design an experiment to answer that question.
  - Describe the objectives and hypotheses
  - Explain how you would collect and analyze the data

#### **Oral presentation (20% of assignment grade)**

Prepare a 25 minute mini-lecture (using PowerPoint if you wish), providing an overview of what your written presentation will cover to educate your classmates about your behavior topic.

As a member of the audience, while your classmates present, you are encouraged to prepare questions. After each presentation, we will have 10 minutes for questions and general discussion. In part, this will serve to help each other refine our conceptual models and proposed experiments as the written paper is finalized.

*The detailed assignment description and grading rubric are posted on Canvas.*

**Literature review drafts should be submitted for feedback by April 13 (optional).**

**Oral presentations will on April 13 or 20. Final written papers are due on April 27.**