Working Dogs in Conservation and Forensic Sciences
VME - XXXX
Course Syllabus

Instructor: Dr. Hayley R. Adams

Office hours: Please contact me via email and we can make an appointment to chat. I will respond to emails within 24 hours on weekdays and within 48 hours on weekends.

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Text (Recommended):
Jezierski, T. (2016). Olfaction Science and Law: Advances in Forensic Science, Medicine, Conservation, and Environmental Remediation. CRC Press.

**Additional readings from relevant literature:*

1. Livestock guard dogs reduce predation on domestic sheep in Colorado. Journal of range management. 2000(3).
2. Agapiou A, Amann A, Mochalski P, Statheropoulos M, Thomas CLP. Trace detection of endogenous human volatile organic compounds for search, rescue and emergency applications. Trends in Analytical Chemistry. 2015;66:158-175.
3. Becker MS, Durant SM, Watson FGR, et al. Using dogs to find cats: detection dogs as a survey method for wide-ranging cheetah. Journal of Zoology. 2017;302(3):184-192.
4. Berns GS, Brooks AM, Spivak M. Scent of the familiar: An fMRI study of canine brain responses to familiar and unfamiliar human and dog odors. BEHAVIOURAL PROCESSES. 2015;110:37-46.
5. Browne CM, Stafford KJ, Fordham RA. Canine Research: The detection and identification of tuatara and gecko scents by dogs. Journal of Veterinary Behavior: Clinical Applications and Research.2015;10:496-503.
6. Cerreta MM, Furton KG. An assessment of detection canine alerts using flowers that release methyl benzoate, the cocaine odorant, and an evaluation of their behavior in terms of the VOCs produced. Forensic Science International. 2015;251:107-114.
7. Edwards TL, Browne CM, Schoon A, Cox C, Poling A. Reviews: Animal olfactory detection of human diseases: Guidelines and systematic review. Journal of Veterinary Behavior: Clinical Applications and Research. 2017.
8. Helmer J. Canine conservationists: by sniffing out invasive insects, highly skilled dogs are on the frontlines of forest conservation: American Forests; 2016.
9. Hughes CE, Ritter A, Lancaster K, Hoppe R. Research paper: Understanding policy persistence—The case of police drug detection dog policy in NSW, Australia. International Journal of Drug Policy.2017;44:58-68.

10. Iqbal MA, Nizio KD, Ueland M, Forbes SL. Forensic decomposition odour profiling: A review of experimental designs and analytical techniques. Trends in Analytical Chemistry. 2017;91:112-124.
11. Jamieson LTJ, Baxter GS, Murray PJ. Identifying suitable detection dogs. Applied Animal Behaviour Science. 2017;195:1-7.
12. Leigh KA, Dominick M. An assessment of the effects of habitat structure on the scat finding performance of a wildlife detection dog. METHODS IN ECOLOGY AND EVOLUTION. 2015;6(7):745-752.
13. Leitch O, Anderson A, Paul Kirkbride K, Lennard C. Review article: Biological organisms as volatile compound detectors: A review. Forensic Science International. 2013;232:92-103.
14. Nizio KD, Ueland M, Stuart BH, Forbes SL. Full length articles: The analysis of textiles associated with decomposing remains as a natural training aid for cadaver-detection dogs. Forensic Chemistry.2017;5:33-45.
15. Oldenburg JC, Schoon A, Heitkönig IMA. Case Study: Wildlife detection dog training: A case study on achieving generalization between target odor variations while retaining specificity. Journal of Veterinary Behavior: Clinical Applications and Research. 2016;13:34-38.
16. Osterkamp T. K9 Water Searches: Scent and Scent Transport Considerations. Journal of Forensic Sciences (Wiley-Blackwell). 2011;56(4):907-912.
17. Pirrone F, Albertini M. Canine Review: Olfactory detection of cancer by trained sniffer dogs: A systematic review of the literature. Journal of Veterinary Behavior: Clinical Applications and Research.2017;19:105-117.
18. Pirrone F, Albertini M. Olfactory detection of cancer by trained sniffer dogs: A systematic review of the literature. Journal of Veterinary Behavior: Clinical Applications and Research. 2017:105.
19. Polgar Z, Kinnunen M, Ujvary D, Miklosi A, Gacsi M. A Test of Canine Olfactory Capacity: Comparing Various Dog Breeds and Wolves in a Natural Detection Task. PLoS ONE. 2016(5).
20. Sarah Catherine B, Tiffani JH, Pauleen Charmayne B. Using scent detection dogs in conservation settings: a review of scientific literature regarding their selection. Frontiers in Veterinary Science, Vol 3 (2016). 2016.
21. Simon AG, Mills DK, Furton KG. Chemical and canine analysis as complimentary techniques for the identification of active odors of the invasive fungus, Raffaelea lauricola. Talanta. 2017;168:320-328.
22. Siniscalchi M, Sasso R, Pepe AM, Dimatteo S, Vallortigara G, Quaranta A. Sniffing with the right nostril: lateralization of response to odour stimuli by dogs. Animal Behaviour. 2011;82:399-404.
23. VerCauteren KC, Lavelle MJ, Gehring TM, Landry J-M. Cow dogs: Use of livestock protection dogs for reducing predation and transmission of pathogens from wildlife to cattle. Applied Animal Behaviour Science. 2012;140:128-136.

Course Description:
The value of the canine nose is well-documented, and working dogs are being increasingly utilized for their olfactory skills in conservation. Dogs are used in forensic

science, in the calculation of population trends of endangered species, in the eradication of invasive species in protected environments, in the identification of disease, and in the identification of infestations and chemical contaminants.

The course is divided into six modules covering: the anatomy, genetics, neurology, and evolution of canine olfaction as well as diseases affecting it; the chemistry and aerodynamics of odors; behavior, learning, and training; uses of canine olfaction in forensics and law; uses in conservation and remediation; uses in detection of diseases and medical conditions.

Student Learning Objectives:
-Identify the basic anatomy & neurology of the canine nose
-Summarize the disease conditions related to the canine nose and describe their potential impact on olfaction
-Discuss the chemistry and aerodynamics of odors
-Outline the basics of dog behavior and learning
-Outline the basic methods of training dogs for scent detection
-Evaluate the current uses and limitations of detection dogs in legal applications
-Describe the use of dogs in forensic sciences
-Describe the use of dogs in the medical sciences
-Identify, research, and write a report on an application of interest with working dogs (based on what is learned throughout the course)
-Recommend a specific area where working dogs could be trained for detection of a conservation-specific application
-Describe the various uses of dogs in conservation

Topics:

Week	Module	Lecture
Week 1	1. Evolution, anatomy, neurology, genetics, & disease	Anatomy of the Canine Nose
		Olfaction & the Canine Brain
		Genetics of Canine Olfaction
Week 2		Effects of Disease on Canine Olfaction
		Olfaction in Wild Canids
		Video Lab: Scent Training I
Week 3	2. Chemistry & Aerodynamics of Odors	Laboratory Odor Analysis
		Aerodynamics of Odor Plumes
		Legal Considerations
Week 4		Video Lab: Scent Training II

	3. Behavior, Learning, & Training	Canine Olfactory Learning & Behavior
		Training Fundamentals & Selection
Week 5		Training Fundamentals II
		Advanced Dog Training
		Training Considerations in Wildlife Detection
Week 6		Video Lab: Canine Behavioral Training
	4. Uses in Forensics & Law	Cadaver Detection
		Training with Volatile Organic Compounds
Week 7		Scent Lineups
		Canine Scent ID in Court
		Video Lab: Canines in Forensics
Week 8	Midterm	
Week 9	5. Medical Detection	Detection of Cancer
		Detection of Seizures & Neurological Disorders
		Detection of Disease
Week 10	6. Uses in Conservation I	Dogs Trained in Insect Detection
		Strategies in Eradicating Invasive Species
		Canine Biodetection
Week 11		Canines in Aquatic and Marine Conservation
		Livestock Guard Dogs
		Video Lab: Canines in Conservation
Week 12	7. Uses in Conservation II	Plant Detection
		Scat Detection
		Conservation Endocrinology
Week 13		Habitat Mapping
		Tracking Poachers
		Tracking Poached Ivory, Horn, & Illegal Wildlife Trade
Week 14	Final Project Work	Companions for orphaned wildlife
Week 15	Presentation & Grading of Final Projects	

Getting Started:
To get started, briefly introduce yourself via the bulletin board then go to the first module. Read through the course content and any required reading listed in the module introduction. Do not hesitate to contact your instructor at any time if you need guidance; if you are unsure about the focus of the assignment; if you have assignment questions or questions relating to the course content. If you don't tell us you need help, we can't help you!

Revision and Notes:
As you go through the semester, keep copies of important emails, bulletins and assignments you may use for revision as these will be purged from the course at the end of the semester. We recommend you make a copy of the course modules since this will be the only access you will get to these materials. We will not be able to provide you with copies of course content once the course is removed from your account.

Course Assignments:
There will be a midterm and final assignment, as well as module assessments and discussion boards.

All written assignments must be completed in your own words. Cutting and pasting from the internet or class notes is not acceptable and may be considered to be plagiarism. Failure to complete an assignment in your own words may result in you receiving a score of zero for the written assignment. When sending course assignments, include your name and please make sure your assignments are labeled clearly. Always keep a copy of your course assignments in case you need to resend it. Also, you may want it for revision purposes later.

Assignment Deadlines:
Please review the information regarding our policy for missed deadlines in the section on Instructional policies. In some courses content modules may be released before the scheduled calendar date to help those who need to work ahead because of work commitments, court appearances, and work related travel. If a module is released ahead of time, the deadline for the assignment and exam will remain the same as it is on the course calendar.

Communication:
Course Email, not the discussion board, should always be used contact the faculty or staff if you have a problem of a personal nature. If you are having technical problems with the course content (downloads, etc) or you are unable to access your course interface, please contact us directly, and please don't spend hours trying to get something to work as this will only lead to frustration. We don't want any of you to be offline for any length of time. Contact us as soon as you can so we can check it out and help you. If you are experiencing difficulty with your access to course email then please email your course

instructor directly via regular email. In that email, make sure you give your name and the name of your course. Please respond to all emails from your instructor or TA. When we email you we are usually contacting you because we want to help you. If you have a question about your grade, an exam, or assignment question, please email us and we'll be happy to help you.

Bulletin Board:
The course bulletin board can be used to post content related questions and assignment materials when necessary. Please ask us questions any time; we are here to help you. Please do not use the community forum to ask specific questions about your current course content, assignments etc. It's VERY important that you read all the discussion bulletins that have been posted. We will use this site to post important information relating to content or exam changes, deadlines etc. Since postings can accumulate quickly, please login each day to stay on top of these postings or you may miss important information. Please make sure you don't post assignments that are supposed to be submitted to the assignment drop box. If you accidentally do, email us as soon as you can and we'll delete it for you.

Points breakdown:
Students will participate in weekly discussions led by the course instructor; participation is worth 5 points per week (**75 pts**)
Module assessments: at the end of each module students will participate in a review, case-based or real-world assessment that emphasizes the theme of the module (**190 pts**)
Midterm assignment/exam (**50 pts**)
Final assignment/exam (**85 pts**)

Total Points: 400

Assignment	Weight	Grading Criteria
Weekly discussion posts	19%	Discussion rubric
Module assessments	47%	Correct answers from M/C, T/F, and SA
Midterm assignment	13%	Midterm rubric
Final assignment	21%	Final rubric

Grades will be rounded up at the decimal of .5 or above, and will be rounded down at .49 or below.

Grades will be assigned as follows:
100-93.4% A
93.3-90.0% A-
89.9-86.7% B+
86.6-83.4% B
83.3-80.0% B-
79.9-76.7% C+
76.6.-73.4% C
73.3-70.0% C-
69.9-66.7% D+
66.3-60.0% D
59.9-0% D-
<60% and below = E

Makeup Policy:
Make up assignments are not usually given, but may be at the discretion of the course instructor after evaluation of the circumstances leading to the request.

Grade Changes:
Grades will be changed only when a grading error has been made. If you think an error has been made, you should email the instructor or TA as soon as possible. Your entire assignment will then be re-graded.

Instructional Policy:
This course is part of the distance education program at the University of Florida. Instead of traditional lecture format, the medium for communication between course instructors, teaching assistants and students will be via WebCT VISTA, a user friendly Web-based classroom management tool, and the World Wide Web.

Attendance: Students *must* participate in the bulletin board discussions, and are required to visit the course website daily for important updates and bulletins.

Class Participation: Students are expected to constructively join in bulletin board discussions, with appropriate preparation; to post interesting and relevant information and articles on the class bulletin board, and to interact professionally with their classmates.

Performance Expectations: Students are expected to produce quality work of a standard comparable to any graduate level didactic course. Bulletin postings and discussions must be legible, constructive and appropriate. Students are required to think for themselves and

will be expected to complete assignments that require the application of logic and reasoning skills when the answer may not be found in a book or the course notes.

Academic Honesty: All students are expected to abide by the student honor code. To review the student honor code read the information on standards of ethical Conduct at: http://www.dso.ufl.edu/judicial/honorcodes/honorcode.php

Plagiarism: Plagiarism includes any attempt to take credit for another person's work. This includes quoting directly from a book or web site, without crediting the source. Sources should always be referenced, a link to the website added, or quotation marks placed around the material. However, we expect more than simply cutting and pasting in this graduate level course. Students are expected to review, evaluate and comment on material they research, rather than simply copying relevant material. Your work will be graded accordingly.

Assignments: While we understand that our students have other work and personal commitments, we expect every effort to be made to meet these deadlines. If for some reason, because of circumstances beyond your control, you are unable to meet an assignment deadline, students should e-mail the professor and explain the situation in advance. Being consistently late in submitting assignments disrupts the discussion of topics on the bulletin board and will therefore result in loss of marks for that assignment up to a full letter grade. If you email us we will work with you around the deadline. If you have outstanding assignments at the end of the semester we will send you a follow up email as a reminder and as a means to determine your plans for completion. If you do not respond to us before the final day of classes you will be assigned a grade based on the completed assignments.

Incomplete grades: Under special circumstances, if a student is unable to finish a course before the end of the semester we may be able to assign an incomplete grade. An incomplete grade is a non punitive grade assigned at the discretion of the course instructor. In this course an incomplete grade may be assigned if 1/3rd or more of the course assignments have been completed and if the student has remained in communication with TA's and instructors throughout the course, or has made an effort to request an incomplete grade. If an incomplete grade is assigned, outstanding assignments must be completed by the end of the next semester. If the assignments are not completed in this time you will be assigned a grade based on the completed assignments.

Drop Dates: consult the UF Calendar of Critical Dates at
http://www.forensicscience.ufl.edu/Students/Dates.asp
Students must inform us that they are withdrawing from a course to ensure appropriate tuition reimbursement. Deleting yourself from the course roster does not officially withdraw you from a course.

Important Dates:
For Assignment deadlines - see the course Calendar in WebCT.

For other important dates, consult the UF Calendar of Critical Dates and http://www.registrar.ufl.edu/

Additional information on the University of Florida Grades and Grading Policies may be found at:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

"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 the accommodation"