ANS 4932 WILD DISCOVERIES: ZOOMING INTO THE SCIENTIFIC METHOD

SUMMER 2016

Course Overview

Course Textbook (**required**):

Research Methodology: a step-by-step guide for beginners. Ranjit Kumar (4th Ed.) Sage publications.

Office Hours (refer to syllabus)

Instructor: Dr. Chris Mortensen, 231E ANS Building

cmortensen@ufl.edu, 392-0133

ANS 4932 Wild Discoveries: Zooming into the Scientific Method

COURSE OVERVIEW

Course Objectives

The ANS 4932 course is designed for students with an interest in research and covers the principles of the scientific method. Students will learn about how scientists have answered some of life's greatest mysteries. By the end of this course, students will not only understand the basics of research, they will have conducted their own personal research project. During the course students will learn about postulating a research hypothesis, develop a research plan, test their hypothesis by collecting and analyzing data, and then report their findings. To facilitate this research experience, the course will use animal behavior as the investigative setting, which is intended to provide a fun and engaging environment for students to learn about the basic tenants of research. At the conclusion of this course students will be able to:

1. Understand how research is planned and conducted
2. Apply the scientific method
3. Design a research experiment
4. Collect and analyze research data
5. Comply with universally accepted research ethics
6. Support research conclusions verbally and in written form

Course Assignments

The course is set up sequentially to assist students in understanding the process of conducting research. Each week (see Course Schedule below) students will discover a new aspect of research that will lead them to conducting their own experiment in collaboration with other students. Students will be expected to complete weekly assignments to keep pace with the course and while no exams will be given, students will be expected to complete a weekly quiz. Finally, at the end of the semester students (in groups) will submit a research report and present a scientific poster to their classmates.

Weekly assignments will be given each week in class, to be due by the posted deadline. Each assignment will be worth 10 points each week. The focus of the assignments will pertain to the topics covered in lecture.

Weekly online quizzes will be given to the students to cover the previous week's lecture and reading material. Each quiz will be worth 10 points and due by the posted deadline.

Discussion topics will be posted and students are required to post each week by the deadline, and is worth 10 points each.

Students will be formed in research teams by week 2 of the semester. Each team will be expected to work together in developing and testing a research hypothesis. At the end of the semester teams will submit a final

written report worth 100 points. In addition, each team will be asked to prepare and present a research poster to the class worth 50 points. Grading rubrics will be provided.

Research Project

The emphasis of this course is on how to conduct sound and ethical research. Therefore, students will be expected to apply the scientific method to investigating animal behavior. The tenants learned can be applied to any field in science, technology, engineering and mathematics (STEM). Weekly assignments are designed to assist the students in this process and are set up sequentially so students will have assistance in developing a research hypothesis, establishing a research plan, executing their research plan in collecting data, learn how to properly analyze their data, and the capstone activity will be students reporting on their data by turning in a short (5-page max) research report and presentation of a research poster on their findings to the class.

Collaborating in research is paramount to having a successful career in any STEM field. Therefore, students will be organized into research teams (~ 5 students each). The purpose is to not only for students to learn how to collaborate together in a research environment, but also for students to assist each other in conducting sound research. Teams will be expected to work together in formulating a research plan, evaluate animal behaviors together, analyze their results and turn in one research report and one scientific poster as one team. Grading rubrics will be provided.

During the semester teams will either be designated to observe animal behaviors as live in person or will observe animal behaviors over web-based cameras. The animals we will be using will be housed either at the University of Florida Department of Animal Science's animal units and/or animals housed at the Santa Fe Teaching Zoo. Teams will schedule with the instructors for viewing times on the species of their choice during the weeks of the semester designated as data collection weeks. A schedule will be posted and students will be given personal access log in information to the camera controls.

Course Research Symposium

Presenting data to the scientific community is critical in any research career. Therefore, at the conclusion of the semester we will hold a special research symposium where teams will be present their research findings in the form of a scientific poster. We will do this online using video conferencing. Students will be given guidance by the instructor in forming their research conclusions and in the building of their scientific poster.

Grading Scale

Total points for the course will be 510 points.

Quizzes	120 points	Research Poster	50 points
Assignments	120 points	Discussion Posts	120 points
Research Report	100 points		

Grade breakdown will be based on the following point totals:

A = 510 to 459
B = 458 to 408
C = 407 to 357
D = 356 to 306
E = < 305

Course Schedule

WEEK 1 **Topic 1: Welcome and syllabus overview**
Quiz 1(syllabus)
Read: Chpt 1 pp. 1-18
Complete CURE survey
Complete Cornell Critical Thinking Test
Read and sign Informed Consent of Students

WEEK 2 **Topic 2: What is the scientific method?**
Quiz 2
History of research — Read: Chpt 2 pp.33-43
Basics of the scientific method — Homework: Meet with research team

WEEK 3 – Topic 3: Animal behavior research
Quiz 3
How to observe & collect behavior data — Read: *Stereotypic behavior of Asian elephant*
Creating & using an ethogram — Homework: Conduct inter-observer test

WEEK 4 – Topic 4: Conducting a literature review
Quiz 4
Learning to read scientific literature — Read: Chpt 3 pp. 48-61
Searching for research articles — Homework: Formulate Team hypothesis

WEEK 5 – Topic 5: Formulating a research plan
Quiz 5
Hypothesis driven research — Read: Chpt 4 pp. 66-74, Chpt 6 pp.99-105, Chpt 13 pp.256-267
Organizing research — Homework: Formulate teach research plan

WEEK 6 – Topic 6: Collecting data
Quiz 6
Data collection techniques — Read: Chpt 9pp.170-190, Chpt12pp.228-234
Organizing a set of data — Homework: Organize data set
Teams begin data collection

****SUMMER BREAK****
Note: No class, but data collection should continue through the break

WEEK 7 – Topic 7: Data analysis

Quiz 7
Making sense of data — Read: Chpt 15 pp 294-309 and 327-329
Simple statistics — Homework: Analyze a given data set

WEEK 8 – Topic 8: Interpreting results

Quiz 8
What does it all mean? — Read: Chpt 16, pp. 332-349
Summarize Findings — Homework: Create two graphs

WEEK 9 – Topic 9: Reporting data

Quiz 9
Compare your research with others — Read: Chpt 17, pp 354-361
Format for sharing results — Homework: Team progress report

WEEK 10 – Topic 10: Abstracts and posters

Quiz 10
What to do when it goes wrong — Read: *How to write a good abstract*
Abstracts and posters — Homework: Team abstract

WEEK 11 – Topic 11: Scientific writing

Quiz 11
Preparing a manuscript (Research Report) — Read: *How to write a scientific article*
Plagiarism — Homework: Team research report draft

Topic 12: Ethics in research

Quiz 12
Laws regulating research — Read: Chpt 14, pp 282-290
Research mistakes and misconduct — Homework: Case study
Teams end data collection

WEEK 12 - Topic 13: Science as a career

Animal and human use protocols — Read: *STEM 101: Intro to tomorrow's jobs*
Careers in STEM — Homework: Complete course wrap up activities

Topic 14: *<u>Course Wrap Up</u>*

Complete CURE Survey
Complete Cornell Critical Thinking Exam
Complete course evaluations

Topic 15: Special research symposium

Location: time to be announced, will be hosted online

Virtual Office Hours

Office hours will be held each week on Monday from 8PM until 9PM through Canvas Chat. You can navigate to the "Chat" feature on Canvas and I will be available and online to answer any questions related to the course material, quizzes or assignments. You are not required to log in or stay for the entire time. If you have any questions please do not hesitate to log in. We will have our first session on the first day of class, so if you have any questions related to the syllabus please jump on.

Make-up Policy

In order to make up any missed quizzes or assignments, verification of illness in the form of a note from the physician will be required that can be scanned in and emailed to Dr. Mortensen. The instructor reserves the right to administer an alternate make-up exam/quiz. All makeup quizzes and assignments must be turned by the date communicated by the instructor. An alternative assignment will be given to any excused students who missed completing their peer evaluations.

Academic Honesty

In 1995 the UF student body enacted a new honor code and voluntarily committed itself to the highest standards of honesty and integrity. When students enroll at the university, they commit themselves to the standard drafted and enacted by students.

In adopting this honor code, the students of the University of Florida recognize that academic honesty and integrity are fundamental values of the university community. Students who enroll at the university commit to holding themselves and their peers to the high standard of honor required by the honor code. Any individual who becomes aware of a violation of the honor code is bound by honor to take corrective action. The quality of a University of Florida education is dependent upon community acceptance and enforcement of the honor code.

The Honor Code: We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.

On all work submitted for credit by students at the university, the following pledge is either required or implied: "**On my honor, I have neither given nor received unauthorized aid in doing this assignment."**

The university requires all members of its community to be honest in all endeavors. A fundamental principle is that the whole process of learning and pursuit of knowledge is diminished by cheating, plagiarism and other acts of academic dishonesty. In addition, every dishonest act in the academic environment affects other students adversely, from the skewing of the grading curve to giving unfair advantage for honors or for professional or graduate school admission. Therefore, the university will take severe action against dishonest students. Similarly, measures will be taken against faculty, staff and administrators who practice dishonest or demeaning behavior.

Students should report any condition that facilitates dishonesty to the instructor, department chair, college dean or Student Honor Court.

(Source: 2010-2011 Undergraduate Catalog)

It is assumed all work will be completed independently unless the assignment is defined as a group project, in writing by the instructor.

This policy will be vigorously upheld at all times in this course.

Students with Disabilities

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

0001 Reid Hall, 392-8565, **www.dso.ufl.edu/drc/**

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. Both the Counseling Center and Student Mental Health Services provide 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. The Counseling Center is located at 301 Peabody Hall (next to Criser Hall). Student Mental Health Services is located on the second floor of the Student Health Care Center in the Infirmary.

- *University Counseling Center*, 301 Peabody Hall, 392-1575, **www.counseling.ufl.edu/cwc/**
- *Career Resource Center,* CR-100 JWRU, 392-1602, **www.crc.ufl.edu/**
    - *Student Mental Health Services,* Rm. 245 Student Health Care Center, 392-1171, **www.counseling.ufl.edu/cwc/**
      Alcohol and Substance Abuse Program (ASAP)

      Center for Sexual Assault / Abuse Recovery & Education (CARE)

      Eating Disorders Program

      Employee Assistance Program

      Suicide Prevention Program

Grading

Please consult UF's new grading policy at:
http://www.registrar.ufl.edu/catalog/policies/regulationgrades.html