

Wildlife 311/511 – Quantitative Methods for Wildlife and Fisheries Research and Management

2020 Fall – Tentative Course Syllabus

Professor: Jason Riddle

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Office Hours: Wednesdays 12-1:50pm, or by appointment

Class Meeting Times: Section 1 (Tuesdays and Thursdays 12:30PM-1:45PM)
Section 2 (Tuesdays and Thursdays 2:00PM-3:15PM).

Learning Outcomes: I don't want you to be afraid of statistics. I want you to love them and understand how they can help you as a natural resource manager/scientist. Students who satisfactorily complete this course should be able to:

- 1) Define what statistics are and why we need them;
- 2) Recognize different data types and choose appropriate graphing techniques for each type;
- 3) Apply and communicate some basic fundamentals of sampling and experimental design;
- 4) Recognize the close relationship between management and experimentation;
- 5) Design your own simple experiments and critique other's experimental design;
- 6) Select the most appropriate parametric and non-parametric tests for a particular hypothesis; and
- 7) Communicate some of the current and future trends in Wildlife statistics.

Prerequisites/Co-requisite: MATH 255 – Elementary Statistical Methods. It also will be helpful if you already have taken a Calculus course.

Textbook: The required textbook for this course is McKillup (2011) *Statistics Explained: An Introductory Guide for Life Scientists*, 2nd Edition, Cambridge University Press. The book is available as a rental, but I highly recommend that you purchase a copy of your own.

Canvas: Most course material and your grades will be available on Canvas.

Classroom Climate: It is critical that you feel comfortable exploring your own ideas and asking questions in this class. Please help me to create a classroom that facilitates questions and conversations about the material.

Course Schedule:

Week 1

- 1/21 Introduction to the course
- 1/23 Why bother with statistics? (Chapters 1 and 2)

Week 2

- 1/28 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)
- 1/30 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)

Week 3

- 2/4 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)
- 2/6 Hypotheses, sample collection, and experimental design (Chapters 3 and 4)

Week 4

- 2/11 Data types, visualization, and communication (Chapter 3)
- 2/13 Data types, visualization, and communication (Chapter 3) & Some probability basics (Chapters 6 and 7)

Week 5

- 2/18 Exam 1
- 2/20 Introduction to Parametric Statistics and descriptive statistics for populations and samples

Week 6

- 2/25 To Be Determined
- 2/27 Descriptive statistics for populations and samples

Week 7

- 3/3 Z-tests and t-tests (Chapters 9 and 10)
- 3/5 Z-tests and t-tests (Chapters 9 and 10)

Week 8

- 3/10 Z-tests and t-tests (Chapters 9 and 10)
- 3/12 Single factor ANOVA (Chapter 11)

Week 9

- 3/17 SPRING BREAK
- 3/19 SPRING BREAK

Week 10

- 3/24 Single factor ANOVA (Chapter 11)
- 3/26 Follow-up tests (Chapter 12)

Week 11

- 3/31 Two factor ANOVA (Chapter 13)
- 4/2 Two factor ANOVA (Chapter 13)

Week 12

- 4/7 Exam 2
- 4/9 Simple linear regression (Chapters 16 and 17)

Week 13

- 4/14 Simple linear regression (Chapters 16 and 17)
- 4/16 Introduction to Nonparametric Statistics and Chi-square tests

Week 14

- 4/21 Chi-square tests & Mann-Whitney test (Chapter 21)
- 4/23 Mann-Whitney test (Chapter 21) and Kruskal-Wallis test

Week 15

- 4/28 Information-Theoretic approaches
- 4/30 Information-Theoretic approaches

Week 16

- 5/5 Undergraduate presentations (Chapter 5)
- 5/7 Bayesian approaches

Final Exam

Section 1: Tuesday, May 12th from 8:00AM to 10:00AM

Section 2: Thursday, May 14th from 8:00AM to 10:00AM

Assignments and Scoring:

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|--------------------|---------------|
| Written Assignment | 50pts |
| Exam 1 | 100pts |
| Exam 2 | 100pts |
| Group Project | 150pts |
| Problem Sets | 250pts |
| Final Exam | 200pts |
| Total | 850pts |

| Grade | % |
|-------|-------|
| A | 93+ |
| A- | 90-92 |
| B+ | 87-89 |
| B | 83-86 |
| B- | 80-82 |
| C+ | 77-79 |
| C | 73-76 |
| C- | 70-72 |
| D+ | 67-69 |
| D | 60-66 |
| F | ≤ 59 |