

BIOL 5301 – Biostatistics – Spring 2026

Instructors:

Lance Williams – BEP 129; Phone: (903) 565-5878; Cell: (903) 952-9448; Email:

lwilliams@uttyler.edu

Office Hours: W and F 8:30-10, or by appointment

Matthew Greenwold – HPR 117; Phone: (903) 566-6303; Email: mgreenwold@uttyler.edu

Office Hours: Tues/Wed/Thurs 11:00 AM – 12:00 PM, or by appointment

Course Description: A critical evaluation of statistical analyses as applied in the biological sciences. Basic properties of experimental design and data analyses will be reviewed with emphasis on current applications in ecology and systematics.

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

- Describe and understand how to apply statistical analyses to data sets
- Understand the statistical assumptions and limitations of data sets and experimental designs
- Learn how to design experimental and observational studies that can be analyzed using univariate and multivariate statistical methods
- Learn how to present results from statistical methods (both in terms of statistical significance and graphically)

Text: Leps and Smilauer. 2020. Biostatistics with R: An Introductory Guide for Field Biologists. Cambridge University Press.

Course Requirements: Participation is expected at all class meetings, and all assignments are due on the dates specified in the schedule. No late assignments will be accepted. As the course only has a few class meetings, any absence should be a documented emergency. Grades will be assigned on a 10-point scale (i.e., 90-100 = A, 80-89 = B, 70-79 = C, 60-69 = D, <60 = F).

Assignments

In Class Assignments

These assignments will cover statistical tests introduced in the lecture. A total of 6 assignments will be required over the course of the semester. Many of the assignments can be completed in class, but if not, they will be due by Friday the week they were assigned. *These assignments will count for 20% of the final grade.*

Exams

Two exams will be given (a midterm and a final). They will be essay and problem solving exams. *They will each count for 40% of the final grade.*

Academic Misconduct: Submitting plagiarized work to meet academic requirements including the representation of another's work or ideas as one's own; the unacknowledged word for word use of another person's ideas; and/or the falsification, fabrication, or dishonesty in reporting research results shall be grounds for charges of academic misconduct. Any cheating or other

type of academic misconduct will be reported to university administration and at minimum will result in automatic failure of the course.

Tentative Schedule

Date	Topic	Assignment Due
1/12	Experimental Design, Hypothesis Testing, & Graphics (Ch. 1-3)	
1/19	No Class	
1/26	R-lab	# 1 (1/30)
2/2	Distributions and t-tests (Ch. 4, 5)	
2/9	R-lab	#2 (2/13)
2/16	ANOVA part 1 (Ch. 6 – 8)	
2/23	ANOVA part 2 (Ch. 9 – 11)	
3/2	R-lab; Midterm Exam (Take home – Due 3/8)	#3 (2/27)
3/9	No Class	
3/16	Correlation & Regression (Ch. 12-13)	
3/23	R-lab	#4 (3/27)
3/30	Multiple Regression, Regression Trees, and Classification (Ch. 14-16; 20-21)	
4/6	R-lab	#5 (4/10)
4/13	Ordination (Ch. 22)	
4/20	R-lab	# 6 (4/24)
4/27	Final Exam (10am – 12 pm – in class)	