BISC 305: Statistics for the Biological Sciences

Lectures: TTh 11:00-12:20 AM   Room: TBA
Discussion: MW 1:00-1:50 PM   Room: TBA

Instructors

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Course Content

Statistics for the Biological Sciences is an introductory course in statistics addressed to students in the life sciences. The learning objective is to illustrate statistical reasoning in biological science and medicine. The students will learn probability models, experimental design, statistical analyses, and interpretation of results. The course uses real data from life sciences.

Textbook

Statistics for the Life Sciences by M.L. Samuels, J.A. Witmer and A. Schaffner. Prentice Hall, 5th Edition.

Grading

There are two mid-term examinations (15% each), a quiz each Thursday (15%), and a final examination (35%). All examinations will occur as scheduled below: there will be no make-up examinations. Note particularly that university regulations strictly regulate the final examination date and time. In addition, there will be homework assignments (10%) and two data analysis projects assigned in the discussion session (5% each). Homework and project-based assignments are to be the independent work of each individual student. A 50% grade deduction will be imposed for late homework, and no homework later than one week will be accepted. Final Exam: May 8, 11am-1pm.

	BISC305	**Statistics for the Biological Sciences**	
	Date	**Topic**	**Lecturer**
Wk. 1	1/09/18	Introduction. Chapter 1, 1-26	PC
	1/11/18	Description of Samples and Populations. Chapter 2, 27-39	PC
Wk. 2	1/16/18	Description of Samples and Populations. Chapter 2, 40-59	PC
	1/18/18	Description of Samples and Populations. Chapter 2, 59-67	PC
Wk. 3	1/23/18	Description of Samples and Populations. Chapter 2, 68-82, Probability and the Binomial Distribution. Chapter 3, 83-87	PC
	1/25/18	Probability and the Binomial Distribution. Chapter 3, 88-98	PC

Wk. 4	1/30/18	Probability and the Binomial Distribution. Chapter 3, 99-115	PC
	2/01/18	The Normal Distribution. Chapter 4, 122-133	PC
Wk. 5	2/06/18	The Normal Distribution. Chapter 4, 133-140 Sampling Distribution. Chapter 5, 146-159	PC
	2/08/18	Confidence Intervals. Chapter 6, 171-193	PC
Wk. 6	2/13/18	Confidence Intervals. Chapter 6, 193-208,211-222	PC
	2/15/18	**First Midterm**	PC
Wk. 7	2/20/18	Comparing of Two Independent Samples. Chapter 7, 223-240	PC
	2/22/18	Comparing of Two Independent Samples. Chapter 7, 241-249	PC
Wk. 8	2/27/18	Association and causation, one-side t-test. Chapter 7, 250-267	PC
	3/01/18	Statistical significance, hypothesis testing principles, Chapter 7, 268-275	PC
Wk. 9	3/06/18	Statistical significance, hypothesis testing principles, Chapter 7, 281-290	FS
	3/08/18	The Wilcoxon-Mann-Whiney test, Chapter 7, 291-306	FS
	3/11-18/18	**Spring Break**	
Wk. 10	3/20/18	Paired sample t-test and confidence interval, Chapter 8, 307-318	FS
	3/22/18	Paired sample signed test, Chapter 8, 325-337	FS
Wk. 11	3/27/18	Categorical data, estimation of proportion, Chapter 355-365	FS
	3/29/18	Categorical data, goodness-of-fit, Chapter 9, 368-382	FS
Wk. 12	4/3/18	Categorical data, relationships, Chapter 10, 383-401, 407-412	FS
	4/5/18	**Second Midterm**	FS
Wk. 13	4/10/18	Many Samples, ANOVA, Chapter 11, 442-454	FS
	4/12/18	Many samples, one and two-way ANOVA, Chapter 11, 455-465, 478-487	FS
Wk. 14	4/17/18	Regression, correlation, Chapter 12, 511-524	FS
	4/19/18	Regression, linear model, Chapter 12, 525-536	FS
Wk. 15	4/24/18	Regression, linear model guidelines, Chapter 12, 537-560	FS
	4/26/18	Overall Review	FS
	12/12/18	**Final Exam** 8am –10am	FS