Mat 2379 C: Introduction to Biostatistics

Professor: M. Alvo

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Office Hours: Monday 9:00-11:00 A.M. or by appointment
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Calendar Description:

Descriptive statistics using a software package. A concise survey of probability. The normal distribution. The central limit theorem and statistical estimation illustrated via simulation. Hypothesis testing, the design of experiments, paired sampling, categorical data and regression illustrated via simulation. Examples appropriate to the biosciences analyzed with statistical software. (Formerly MAT 2378).

Prerequisite: One of MAT1322 or MAT1332. This course cannot be combined for credit with MAT1371, MAT1372, MAT2375, MAT2377, ADM2303, ECO3150, HSS2381 or PSY2106.

Textbook: Statistical for the Life Sciences by M.L. Samuels and J.A. Witmer Third edition. We will cover approximately Chapters 2-10, 12

Evaluation: If the score on the final exam is less than 40%, then

Course grade = Final exam score

Otherwise the course grade is calculated as follows

Mid-term (Thursday June 2 2011)	25%
Homework*	15%
Final exam	60%
Total	100%

The final exam for MAT 2379/2779 3X is:
Thursday 2011-07-21 to 2011-07-21 STE H0104 16:00 - 19:00

*Homework is to be remitted at the beginning of the Thursday class

NOTE: The mid-term may be replaced for whatever reason and in that case, the final exam will count for 85% .All exams are open book

The proposed syllabus below will serve as an introduction to statistics. It will offer a practical approach and rely on the computer software MINITAB for illustrating main concepts.

Dates	Topic	Content
May 3; May 5	Descriptive Statistics (2.1-2.6)	Histograms; descriptive measures; Box plots; MINITAB introduction
May 10; May12 May 17	Probability (3.1-3.8)	Sample space; axioms of probability; random variables; distributions. Simple applications to genetics
May 19	Normal distribution (4.1- 4.5)	Definition and calculations involving the normal distribution
May 24	Sampling distributions (5.1-5.5)	Small and large sample distributions; Central limit theorem via simulation
May 26	Estimation (Ch. 6)	Point and interval estimates for the mean and a proportion
May 31	Review	
June 2	Midterm exam	Ch.2-Ch.6
June 6-June 10	Study break	
June 14	Testing (Ch. 7)	Hypothesis testing for two independent samples
June 16; June 21	Testing (Ch. 7)	More on testing & estimation
June 23	Paired sampling (Ch. 9)	paired testing; simulation t-test, sign test and Wilcoxon signed rank test
June 28; June 30	Ch. 8	Principles for designing an experiment; blocking, stratification and replication
July 5	Regression (12.1-12.4)	Linear regression model: estimation and testing.
July 7; July 12	Categorical data (10.1-10.3)	Chi-square test; contingency tables; odds ratio
July 14	Review prior to final exam	
July 21	Final exam	

Homework	Exercises	Due date
1	2.4, 2.24, 2.33,2.66, 2.73	May 12
2	3.27, 3.28, 3.31, 3.39, 3.42, 3.46	May 19
3	4.1, 4.3, 4.9, 4.26, 4.41,	May 26
4	5.3, 5.15, 5.22, 5.42, 5.44, 5.47	June 16
5	6.12, 6.34, 6.39, 6.64	June 23
6	7.1, 7.8, 7.30, 7.54, 7.60, 7.85, 9.4, 9.19, 9.31	June 30
7	8.21, 8.38, 10.1, 12.45	July 7