Syllabus for BIOL 291.2/ENVR 291.2
Quantitative Methods in the Life & Environmental Sciences

Instructor: Dr. Frank T. Kuserk
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Office Hours: MWF 10:00-11:30 AM and by appointment

Classrooms: 201 Memorial Hall; Tuesday 10:20 AM-11:30 AM

Course Description: This course introduces mathematical concepts and analytical methods as applied to data encountered in the life and environmental sciences. It emphasizes the basic concepts of experimental design, quantitative analysis of data, and statistical inferences. Topics include probability theory and distributions; population parameters and their sample estimates; descriptive statistics for central tendency and dispersion; hypothesis testing and confidence intervals for means, variances, and proportions; the chi-square statistic; categorical data analysis; linear correlation and regression model; analysis of variance; and nonparametric methods. The course provides students a foundation to evaluate information critically to support research objectives and a better understanding of statistical design of experiments.

Course Objectives: Upon completion of this course students will be able to:

1) apply the principles of study design and data collection to research problems in the life and environmental sciences
2) understand the basic mathematical and statistical procedures used to analyze data
3) apply these techniques utilizing a standard analytical package
4) understand the concepts of random variation and bias
5) produce and interpret graphical summaries of data
6) recognize pitfalls in interpreting data

Texts: No specific texst are required for this course. All instructional materials will be distributed by the instructor or available on the Internet.

Class Attendance: It has been my experience that students who do poorly in my courses generally have numerous absences. I strongly suggest that you attend and participate in all sessions unless you have a valid reason not to. Because this class involves hands-on

experiences that cannot be mastered effectively without performing them, classes are especially critical if one is to become a successful scientist. Unexcused absences will result in a lowering of your grade by 30 points (3%) for each absence. Excused absences from class beyond the first two (2) will result in a lowering of your lab grade by 30 points for each absence. You are still required to complete any assignment associated with a class in order to receive the points associated with that assignment.

Grading: The grading system is as follows:

A	= 93.0 - 100.0	C	= 73.0 - 76.9
A-	= 90.0 - 92.9	C-	= 70.0 - 72.9
B+	= 87.0 - 89.9	D+	= 67.0 - 69.9
B	= 83.0 - 86.9	D	= 63.0 - 66.9
B-	= 80.0 - 82.9	D-	= 60.0 - 62.9
C+	= 77.0 - 79.9	F	= 59.9 and below

Assignments:		
	Homework	600 points
	Quizzes	300 points
	Final Exam	100 points
		1000 points

Policy on Academic Honesty:

Moravian College expects its students to perform their academic work honestly and fairly. A Moravian student, moreover, should neither hinder nor unfairly assist the efforts of other students to complete their work successfully. This policy of academic integrity is the foundation on which learning at Moravian is built.

The College's expectations and the consequences of failure to meet these expectations are outlined below. If at any point in your academic work at Moravian you are uncertain about your responsibility as a scholar or about the propriety of a particular action, consult your instructor.

Disability Accommodations:

Students who wish to request accommodations in this class for a disability should contact Elaine Mara, assistant director of learning services for academic and disability support at 1307 Main Street, or by calling 610-861-1510. Accommodations cannot be provided until authorization is received from the Academic Support Center. Do this as soon as possible to enhance the likelihood that such accommodations are implemented in a timely fashion. Any student who wishes to disclose a disability and request accommodations under the Americans with Disabilities Act (ADA) for this course first MUST meet with either Mrs. Laurie Roth in the Office of Learning Services (for learning disabilities and/or ADD/ADHD) or Dr. Ronald Kline in the Counseling Center (for all other disabilities).

Lecture Schedule*
Fall 2013

Day & Date			Topic
Th	Aug.	29	Significant Figures; Units and Conversions
Th	Sept.	05	Manipulating Numbers
Th	Sept.	12	No class: All-College Convocation
Th	Sept.	19	Molarities and Dilutions
Th	Sept.	26	Areas and Volumes; Exponents and Logs
Th	Oct.	03	Introduction to Statistics
Th	Oct.	10	Descriptive Statistics
Th	Oct.	17	Probability
Th	Oct.	24	Inferential Statistics: Hypothesis Testing; Student's t-test
Th	Oct.	31	Inferential Statistics: Analysis of Variance and Chi-Square
Th	Nov.	07	Non-Parametric Statistics
Th	Nov.	14	Regression and Correlation
Th	Nov.	21	Experimental Design
Th	Nov.	27	No class: Thanksgiving break
Th	Dec.	05	Miscellaneous Analyses

Final Exam: Friday, December 13 @ 1:30 PM

*These topics and dates are tentative and subject to change.