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

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Office Hours: MWF 9:00-10:00 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.

Guidelines for Honesty

All work that you submit or present as part of course assignments or requirements must be your original work unless otherwise expressly permitted by the instructor. This includes any work presented, be it in written, oral, or electronic form or in any other technical or artistic medium. When you use the specific thoughts, ideas, writings, or expressions of another person, you must accompany each instance of use with some form of attribution to the source. Direct quotes from any source (including the Internet) must be placed in quotation marks (or otherwise marked appropriately) and accompanied by proper citation, following the preferred bibliographic conventions of your department or instructor. It is the instructor's responsibility to make clear to all students in his or her class the preferred or required citation style for student work. Student ignorance of bibliographic convention and citation procedures is not a valid excuse for having committed plagiarism.

When you use the specific thoughts, ideas, writing, or expressions of another person, you must accompany each instance of use with some form of attribution to the source.

You may not collaborate during an in-class examination, test, or quiz. You may not work with others on out-of-class assignments, exams, or projects unless expressly allowed or instructed to do so by the course instructor. If you have any reservations about your role in working on any out-of-class assignments, you must consult with your course instructor. In each First-Year Seminar class and in the Writing Center, we try to establish a community of writers who can review and provide helpful criticism of each other's work. Although no students in your class or in the Writing Center should ever be allowed to write your paper for you, they are encouraged to read your work and to offer suggestions for improving it. Such collaboration is a natural part of a community of writers.

You may not use writing or research that is obtained from a "paper service" or that is purchased from any person or entity, unless you fully disclose such activity to the instructor and are given express permission.

You may not use writing or research obtained from any other student previously or currently enrolled at Moravian or elsewhere or from the files of any student organization, such as fraternity or sorority files, unless you are expressly permitted to do so by the instructor.

You must keep all notes, drafts, and materials used in preparing assignments until a final course grade is given. In the case of work in electronic form, you may be asked to maintain all intermediate drafts and notes electronically or in hard copy until final grades are given. All these materials must be available for inspection by the instructor at any time.

A student may appeal either a charge of academic dishonesty or a penalty as follows:

1. First, to the course instructor.
2. Next, in the case of First-Year Seminar, to the Chair, First Year Seminar Committee.
3. Next, to the Academic Standards Committee, chaired by the Associate Dean for Academic Affairs.

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 2012

Day & Date			Topic
T	Aug.	28	Microsoft Excel Basics; Significant Figures
T	Sept.	04	Units and Conversions; Manipulating Numbers
T	Sept.	11	Molarities and Dilutions
T	Sept.	18	Areas and Volumes; Exponents and Logs
T	Sept.	25	Introduction to Statistics
T	Oct.	02	Descriptive Statistics
T	Oct.	09	No Class-Fall Break
T	Oct.	16	Probability
T	Oct.	23	Inferential Statistics: Hypothesis Testing; Student's t-test
T	Oct.	30	Infeential Statistics: Analysis of Variance and Chi-Square
T	Nov.	06	No Class
T	Nov.	13	Non-Parametric Statistics
T	Nov.	20	Regression and Correlation
T	Nov.	27	Experimental Design
T	Dec.	04	Miscellaneous Analyses

Final Exam: Friday, December 14 @ 1:30 PM

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