Marshall University Syllabus

Course Title/Number	Biostatistics – BSC 417/517
Semester/Year	Spring 2016
Days/Time	TR 11:00-12:15
Location	S 166
Instructor	Dr. Jeff Kovatch
Office	Science Building 122A
Phone	304-696-3829
E-Mail	kovatch@marshall.edu
Office Hours	TR 15:30-16:30 & W 13:30-16:30
University Policies	By enrolling in this course, you agree to the University Policies listed below. Please read the full text of each policy by going to www.marshall.edu/academic-affairs and clicking on "Marshall University Policies." Or, you can access the policies directly by going to www.marshall.edu/academic-affairs/policies/. Academic Dishonesty/Excused Absence Policy for Undergraduates/Computing Services Acceptable Use/Inclement Weather/Dead Week/Students with Disabilities/Academic Forgiveness/Academic Probation and Suspension/Academic Rights and Responsibilities of Students/Affirmative Action/Sexual Harassment

Course Description

Statistical skills for biological/biomedical research, with emphasis on applications, experimental design/survey sampling, estimation/hypothesis testing procedures, regression, ANOVA, multiple comparisons. (PR: BSC 302, 320, 322, or 324)

Required Texts and Other Materials

1. Glover, T. and Mitchell, K. 2016. *An introduction to biostatistics*. 3rd Ed., Waveland Press, Long Grove, Il.
2. A calculator capable of doing at least single list functions (look for the symbol) is recommended.

Grading Policy

Letter grades will be assigned as follows:

A = 90 - 100% B = 80–89% C = 70–79% D = 60–69% F = <60%

Proportional point allocation for the course:

Exams	80 %
Online Quizzes	12 %
Brief Project	8 %

I do not offer extra credit assignments.

Student Learning Outcomes for BSC 431/531

Course student learning outcomes	How students will practice each outcome in this course	How student achievement of each outcome will be assessed in this course
Demonstrate ability to use common research methods and designs in biology	In-class exercises and practice problem sets, homework	All examinations
Discuss the use of critical thinking and, when possible, the scientific approach to solve problems within the field of biology	In-class exercises and practice problem sets, homework	All examinations
Explain, calculate, and interpret descriptive statistics	In-class exercises and practice problem sets, homework	Exam 1 Homework Quizzes
Explain, calculate, present, and interpret inferential statistics	In-class exercises and practice, problem sets, homework	Exams 2-4 Homework Quizzes

Course Requirements

Lecture exams: There will be four exams. Each exam will be worth 20% of the total course grade. The fourth exam will be given on the day scheduled for the final. Material on examinations can include information from lectures, assigned readings, and assigned homework. Please notify me in advance if you know you will miss an exam (see Attendance Policy below). *I do not offer extra credit assignments.*

All exams will be open-source. You are expected to bring a calculator, extra paper, and a pencil to all exams. You will have access to your computer for exams.

Exams with correct answers that do not show work or equations used will receive only partial credit, and partial credit will be given for work shown that has minor arithmetic errors. Answers without correct units will not receive full credit.

When completing calculations for homework, exams, or quizzes, you are required to complete all intermediate calculations to four decimal places. When you report a final answer, answer it to the appropriate significant units. If a final answer to one question is an intermediate calculation for the next question, then use at least two figures beyond the significant figures to continue calculations in the subsequent question. That is, do not introduce rounding error at intermediate steps. Appropriate units for the problem (e.g., mg O_2 /ml H_2O) are expected, and partial credit can be lost for incomplete, incorrect or missing units.

Online Quizzes: Short (~ 5 questions) online quizzes will be posted for each lecture section. The sum of these 5 points quizzes (= 55) will be worth 12% of the total grade. Quizzes for each Unit will be open until midnight before the scheduled exam for that Unit. That being said, I advise that you do not wait until then to complete the quizzes. If you have problems with the quizzes you need to come see me as soon as possible.

Short Projects: A few short projects that will test your ability to display and represent data and results will be given during the semester. The sum of these short projects will comprise 8% of the final grade. Details about the projects will be given throughout the semester.

Mathematical and Computer Literacy

I make use of MUOnline (http://www.marshall.edu/muonline) for posting the syllabus, delivering homework assignments, posting quizzes, recording grades, posting supplementary material, and providing announcements. I do not use the MUOnline email feature. To email me, please use your Marshall account and contact me at kovatch@marshall.edu. Notify me within the first week of class if you cannot access this course on MUOnline.

We will use a computer based statistical package during the course for homework problem sets and examinations. It is your responsibility to download the program to your computer for home use. Problems with the software should be brought to the instructor's attention at the earliest opportunity.

Math is an integral part of statistics. I will assume you are comfortable with basic algebra, orders of operations, substituting values into formulas, carrying out arithmetic functions, powers, roots, and logarithms. It is not the purpose of this course to teach you these math skills. An understanding of calculus or other higher order math is not necessary for this course.

Attendance Policy

Attendance in lectures is expected. Students are responsible for all activities and announcements that occur during lecture. It is expected that students actively participate in the course by coming to class prepared and ready to learn. Students should bring questions about the reading material or homework/problem sets to class for discussion. Students can expect to be called on to verbally participate in this course. Failure to be prepared for class or disruptive behavior, at the instructor's discretion, can lead to dismissal from the class for the day.

Students are expected to be on time for lectures and exams. Arrival for an exam after the first person has handed in their exam will result in you not being allowed to take the exam. Absences and from exams due to illness, death in the family, or institutional activities will be excused only with an official university excuse from the MU Student Affairs Office (MSC 2W38). Make-up exams will only be administered for excused absences. The instructor must be notified within 10 days of the missed exam in order to be eligible for a make-up exam.

Student Responsibility

Students are responsible for reading the appropriate material from the textbook, reading other posted materials, and completing homework. Students are required to stay on task during the lecture exercises. Students may be asked to work in groups during class time. Students are responsible for any material missed. Missed information should be obtained from classmates.

Communications from the instructor may come via your Marshall email account, MUOnline and/or lecture. It is your responsibility to check both your Marshall email account and MUOnline regularly. Electronic communications to the instructor must have BSC 417 or BSC 517 in the subject line, include your full name in the message, and be written formally. Again, do not use the email option with MUOnline.

Records

Exams and answer sheets will be kept for one semester or summer term following completion of the course.

Grades will not be given or discussed over the phone or e-mail. You must be present during lecture or lab to collect graded exams, quizzes, and lab reports. Students should keep all returned exams score sheets and lab reports so that their relative standing in the course can be known at any time. All grades appeals must be done formally in writing and with 10 calendar days of the returning of the graded item to the student.

Portable Electronic Devices and Food Items

All portable electronic devices (e.g., cell phones.) must be turned off during class. *Failure to do so may result in your dismissal from that lecture period.* Audio or video recording of lectures is not permitted without prior consent of Dr. Kovatch.

Food and drinks are not permitted in the computer lab. This policy will be enforced.

Tentative Course Schedule

Date	Topic	Unit	Chapter	Projects
1/12	Course Intro			
1/14	Descriptions of data	1	1	
1/19	Introduction to R	1		
1/21-26	Probability	1	2	
1/28	Probability Distributions	1	3	
2/2-4	Sampling Distributions	2	4	
2/9	Hypothesis Testing	2	5	
2/11	Exam 1			
2/16-18	One Sample Hypothesis Test	2	6	P1
2/23-3/1	Two Sample Hypothesis Test	2	7	
3/3-8	Sampling Approaches	3	---	
3/10-15	ANOVA	3	8	P2
3/17	Exam 2			
3/22-24	*Spring Break*			
3/29-31	ANOVA	3	8	
4/5-7	Factor Analysis	3	9	P3 4/7
4/7	Factor Analysis	3		P3
4/12	Exam 3			
4/14	Correlation	4	10	
4/19-21	Regression	4	10	
4/26-28	Goodness of Fit Test	4	11	P4 4/28
5/5	Unit 4 Exam (10:15-12:15)			