Contact Information:
Instructor: Solomon W. Harrar, Ph.D.
Office Hours: MW 1:10-2:25 PM or by Appointment
Office: Math 213
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Class Time and Place: MTWF 10:10-11:00AM, Math 306

Learning Goals:
1. To learn how to describe and explore sets of data both numerically and graphically.
2. To learn about the normal, binomial, and other basic models for the distribution of a single variable and the linear regression model for the relationship between two or more variables.
3. To understand basic probability theory, and the importance of the normal distribution and Central Limit Theorem to statistical inference.
4. To learn the fundamental ideas of statistical inference for means, proportions and variance in one, two and multi-sample settings with biomedical applications.
5. To learn the basics of good study design for clinical trials and biomedical experiments.
6. To learn common advanced statistical inference for continuous, binary, count, incidence-rate and time-to-event data with biomedical applications.
7. To learn how to critically evaluate scientific journal articles with respect to the material learned in this class.
8. To learn script writing and data analysis in the statistical software R.

Required Textbooks:
- Chapter 1, Introductory Statistics with R, 2nd Ed., Peter Dalgaard. You can have a free access to the online version of this book if you are connected to the university network either directly or via VPN. Springer sells a paper-back copy of the whole book for $25 to UM students (see http://www.springerlink.com/content/978-0-387-79053-4/mycopy/). This website may not work correctly unless you are connected to the university network.

Course Content: We will cover selected sections from chapters 1 – 14 of the text book.
- Introduction and Basics of R (Chapter 1 of Rosner and Chapter 1 of Dalgaard)
- Descriptive Methods and Probability Models (Chapters 2-5 of Rosner)
- Basic Statistical Inference (Chapters 6-12 of Rosner)
- Advanced Statistical Inference (Chapters 13-14 of Rosner)
- Study Design (Chapters 6-14)
- Computation with the R-software (Chapters 1-16 Dalgaard)

Prerequisite: One year of college mathematics including Math 105 or equivalent course in probability or consent of instructor.

Course Pace: A prior background on Elementary Probability and some familiarity with basics of Statistics are assumed. The first five chapters should come somewhat familiar to you. We will rush through these Chapters and spend more time on the relatively new materials. Keep in mind that the best sources of information for students are their textbooks. So I expect you to read the textbook and do all the assigned homework problems. The course includes the use of computer software R as an essential component. Lectures in the basics of this software will be given in the first week of class and later as needed. I expect you to read the introductory book by Peter Dalgaard so that you will have a reasonable competency in R.

Performance Assessments:
- Homework (15%)
Stat 491: Biostatistics,  
Course Syllabus, Fall 2012

- 2 Mid Terms (50%)
- Final Exam (35%)

**Tentative Test Dates:**
- Mid Term I (Chapters 1-7): October 5, 2012
- Mid Term II (Chapters 8-12): November 16, 2012
- Final Exam (Chapters 1 and 14): Official Schedule


**Homework:** There will be 12 homework assignments in this course. Some of the homework problems may be based on materials that are discussed in the book but not directly treated in class. Please know that we may not be able to entertain all homework related questions in class but I will be more than happy to assist you during office hours or by setting up an appointment. Homework assignments must be done cleanly (preferably typed) in an 8 1/2 X 11 size papers, must be stapled, if extends more than one page, and answers must be written in complete sentences. When a homework assignment involves data analysis in R, you should include only essential and relevant results from R output in your write up. A straight copy and paste is not acceptable. Homework assignments have to be done individually. You are not allowed to work together with another student beyond exchanging ideas on some of the problems.

**Make Up:** If you can not make it to an in class exam due to a reason for which you can produce acceptable documentation (as judged by me), please let me know as soon as possible. Make up will not be allowed for home works. In the event that you have to miss a graded home work due to an excusable absence (as judged by me), I will double count your previous or future graded works.

**Attendance:** I expect you to attend class regularly. However, attendance and class participation will have only the obvious indirect bearing on your course grade. However, in the event that a student has to miss a class, he/she is responsible to get caught up with the materials covered and homework assigned.

**Course webpage:** The course webpage is located at [www.math.umt.edu/harrar/stat491](http://www.math.umt.edu/harrar/stat491). The syllabus, course schedule, homework assignments, due dates, test dates, data sets, solutions and announcements will be posted on the webpage. Please stay tuned.

**Disability:** The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students (DSS). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with DSS, please contact DSS in Lommason 154. I will work with you and DSS to provide an appropriate accommodation.

**Student Code:** All students need to be familiar with the Student Conduct Code. You can find it in the “A to Z Index” on the UM home page.

**Academic Honesty:** All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

**Academic Calendar:** See the 2011-12 academic calendar of the university on the web [http://www.umt.edu/provost/about/academiccalendar.aspx](http://www.umt.edu/provost/about/academiccalendar.aspx) for important dates.