Statistics 5198: Epidemiology for Statisticians
Syllabus, Fall 2015

Class Meetings: Tuesday and Thursday, 9:30-10:45 AM, OSB 215
Instructor: Elizabeth H. Slate
Office: OSB 210D
Phone: 850-778-3549 (Leave a message if I don't answer.)
Email: slate@stat.fsu.edu
Office Hours: Tentatively 10:45-12:00 Tuesday, Thursday or by appointment.

This course focuses on statistical methods for epidemiological research. We will follow the text *Epidemiology: Study Design and Data Analysis*, 3rd edition, by Mark Woodward (2013), in part. Woodward provides foundational material (Chapters 1-4), discussion of the major study designs used in epidemiology (Chapters 5-7), statistical analysis details (Chapters 9-11), focus on design via sample size (Chapter 8), meta-analysis (Chapter 12), risk scores (Chapter 13) and discussion of some computer-intensive methods (Chapter 14). We cannot cover all of this material!, but will focus on fundamentals, also drawing material from other sources. Woodward provides exercises (with some solutions available) that will provide additional basis for class discussions and sharpening your understanding of concepts.

Material will be drawn from the additional texts listed below, as well as from the published literature.

- *Modern Epidemiology*, 3rd edition, by K. J. Rothman and S. Greenland and T. L. Lash
- *Statistical Models in Epidemiology*, 1993, by D. Clayton and M. Hills
- *Statistics for Epidemiology*, 2004, by N. Jewell

…and there are many others! It is always good to get another perspective on an area.

Tip: Read and consider all of the exercises. Read ahead and record the major points; bring questions to class or office hours.

Prerequisites: STA 5167 *Statistics in Applications II* and STA 5327 *Statistical Inference* or permission of instructor.

Course Objectives: Upon completion of the course, the student will be able to distinguish different measures of disease occurrence and risk exposure; compute the key disease-exposure association measures, including odds ratio, relative risk, and attributable risk and provide corresponding uncertainty estimates; distinguish epidemiology study designs and determine the statistical features (potential for biases, power, sample size, analysis methods) for these designs; assess confounding among variables and perform appropriate analyses; and evaluate the performance of tests for screening and diagnosis.

Grading is based on **homework** (25%, approximately weekly and any other assigned work), two **exams** (25% each), a final project/test (25%). **Quizzes** are a possibility, whether announced in advance or not. Performance on quizzes will be included in the exam portion of the grade. The exams are ***tentatively*** scheduled for Tuesday Sept. 22th (in class) and Thursday October 29th (in class); please alert me to any conflicts.

Policy on homework: Unless otherwise directed, you may discuss homework problems with other students according to the following policy:

> No student should ask for or offer assistance from any other student until that student has made a serious effort to solve the problem. After such an effort has been made, then students may seek help from the instructor, fellow students or others. Appropriate cite all sources that provided significant aid in your solution. *All work must be written up individually.*

Late homework will not be accepted unless prior arrangement has been made with the instructor.
Exam problems may not be discussed with anyone other than the instructor.

Data Analysis: Homework assignments will require statistical data analysis. Various packages may be illustrated in class (SAS, R, Stata, etc.), and you may use your choice of software for the assignments. (Just make sure you understand what is being computed!) *Your analysis solutions should consist of a write-up explaining your approach to the problem and your findings in the context of the problem, as if you are a statistical consultant addressing a client. Statistical results not easily incorporated into the text should be displayed in tables and figures that are referenced from the text. I will not look at tables and figures that are not drawn to my attention in your written report!*

SAS® OnDemand: You may consider using SAS Studio for accessing SAS software remotely. To proceed, register for Academics and then access SAS Studio. Here's how to get started:

- Access the following Web site: http://support.sas.com/ondemand
- Review the information and register for OnDemand. Our course enrollment link is: https://odamid.oda.sas.com/SASODAControlCenter/enroll.html?enroll=5a73223c-a0b1-41c2-9766-df5947537e52
- The LIBNAME for our course data is /courses/d33e19e5ba27fe300
- If you have additional questions about using SAS® OnDemand for Academics, see http://support.sas.com/ondemand or contact me.

SAS may also be accessed via the FSU virtual lab (http://its.fsu.edu/Computing/Computer-Labs/myFSUVLab), as can SPSS, Stata, JMP, R, Matlab, and Maple, among others.

Web site: The course web site is http://stat.fsu.edu/~slate/5198.

University Attendance Policy: Excused absences include documented illness, deaths in the family and other documented crises, call to active military duty or jury duty, religious holy days, and official University activities. These absences will be accommodated in a way that does not arbitrarily penalize students who have a valid excuse. Consideration will also be given to students whose dependent children experience serious illness.

Academic Honor Policy: The Florida State University Academic Honor Policy outlines the University's expectations for the integrity of students' academic work, the procedures for resolving alleged violations of those expectations, and the rights and responsibilities of students and faculty members throughout the process. Students are responsible for reading the Academic Honor Policy and for living up to their pledge to ". . . be honest and truthful and . . . [to] strive for personal and institutional integrity at Florida State University." (Florida State University Academic Honor Policy, http://fda.fsu.edu/Academics/Academic-Honor-Policy.) It is your responsibility to appropriately acknowledge all sources that helped in your preparation of all submitted materials.

Americans With Disabilities Act: Students with disabilities needing academic accommodation should:
(1) register with and provide documentation to the Student Disability Resource Center; and
(2) bring a letter to the instructor indicating the need for accommodation and what type. This should be done during the first week of class. This syllabus and other class materials are available in alternative format upon request. For more information about services available to FSU students with disabilities, contact the Student Disability Research Center (http://www.disabilitycenter.fsu.edu/):

874 Traditions Way 108 Student Services Building; Florida State University Tallahassee, FL 32306-4167	(850) 644-9566 (voice) (850) 644-8504 (TDD) sdrc@admin.fsu.edu

Tentative Syllabus
Topics may change according to the pace of the course and interests of the students.

Topic	**Text reference**
Introduction	Chapter 1
Basic analyses	2.1-2.8 are assumed familiar and will not be discussed
Agreement, diagnostic tests	2.9-2.10
Incidence, prevalence, risk, risk ratio, odds, odds ratio, rates, attributable risk	Chapter 3
Confounding and interaction	Chapter 4, 10.3, 10.6, 10.8, 10.9
Cohort studies, overview of survival analysis	Chapter 5, 11.1-11.7
Case-control studies, unmatched and matched	Chapter 6, 10.13
Design Considerations	Chapter 8

Additional topics to be selected may include:

- Meta-analysis, Chapter 12
- Risk scores, Chapter 13
- Measurement error, 10.12, other sources
- Screening tests, other sources
- Infectious disease modeling, other sources
- Comparative effectiveness studies, other sources