The George Washington University  
Department of Statistics

COURSE AND CONTACT INFORMATION

Course: Statistics 6214 Applied Linear Models  
Semester: Fall 2012 (08/28/12 - 12/15/2012)  
Class: Tuesday Noon-3:00 pm  
Location: Arlington 602 (http://goo.gl/maps/YLMu4)

INSTRUCTOR
Name: Professor Jeremy Wu  
Campus Address: Rome Hall 676  
Phone: (703)-462-3068  
E-mail: jswu@gwu.edu  
Office hours: Tuesdays 3-5 pm at Arlington Education Center  
950 N Glebe Road, 6th floor  
Arlington, VA 22203

Grader/TA: Biao Yang  
(yangbiao@gwmail.gwu.edu)

COURSE DESCRIPTION

“All models are wrong, but some are useful.”  
- George E. P. Box, Statistician

Advancing information technology has greatly expanded the approach to data analysis and opened many new frontiers and opportunities for statisticians. Modeling is one of the most widely used statistical methods, but why are we studying something that is always wrong? How do we tell which models are useful and which are not when computer printouts can be easily generated? Availability of data does not replace the need for properly designed data collection and statistical thinking in applying statistical models and methods to visualize and extract maximum information. This course will discuss and impart important fundamental ideas and methods in regression, computation, limitations and properties, and interpretation of results, especially in a rapidly changing environment for statisticians.

COURSE PREREQUISITES:  
MATH 2233 Multivariate Calculus and MATH 2184 Linear Algebra I or equivalent

TEXTS:  
Interscience.  ISBN: 9780470905845 (required)

Incorporated. ISBN: 9780471663799 (recommended)
General Course Outline (order may not be exact):

- Fundamental statistical concepts
- Traditional and evolving steps in regression analysis (Chapter 1)
- Fundamentals of models and computation
- Simple linear models/regression (Chapter 2)
- Multiple linear models/regression (Chapter 3)
- Model diagnostics (Chapter 4)
- What can go wrong? What can we do? (Chapters 6-10)
- Beyond usual linear models (Chapter 5, 11, 12)
- What is happening in the real world?

LEARNING OUTCOMES:
As a result of completing this course, the student will be able to

- Understand fundamental statistical concepts related to regression analysis
- Apply regression methods to analyze data and interpret results for linear models
- Appreciate the potential challenges and latest practical development

GRADING

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<tr>
<th>Component</th>
<th>Percentage</th>
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<tr>
<td>Weekly Homework/Reading Assignments</td>
<td>25%</td>
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<tr>
<td>Class Participation</td>
<td>5%</td>
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<td>Quizzes (4-6)</td>
<td>20%</td>
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<td>Mid-term Examination</td>
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<td>Final Examination</td>
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<tr>
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<td>&lt;60</td>
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Incomplete: will only be considered when 1) you are passing the course AND 2) cannot complete the course due to illness or other circumstances beyond your control.

Software: SAS with optional use of R and Tableau
Visit ITL (basement of Gelman Library) for a copy of SAS on your PC
SAS manual online at http://support.sas.com/onlinedoc/913/docMainpage.jsp

Visit http://cran.r-project.org/bin/macosx/ for a copy of R for Mac OS X
Visit http://cran.r-project.org/bin/windows/base/ for a copy of R for Windows
Visit http://math.illinoisstate.edu/dhkim/rstuff/rtutor.html for simple R tutorial

Tableau (http://www.tableausoftware.com/) is distributed through Blackboard.

Quizzes:
Quizzes are closed book and notes. In general, they will NOT be announced in advance.

Datasets:

Homework/Reading assignments:
Submit homework electronically to Blackboard with copies to Instructor and Grader; expect extensive use of Internet.
CLASS POLICIES

Attendance policy:
You are expected to attend and participate actively every lecture. You are responsible for the material covered and the referenced handouts.

Late work: will not be accepted.

Blackboard:
Check [http://blackboard.gwu.edu/](http://blackboard.gwu.edu/) for the latest course information.

Class Lectures/Notes:
Will be made available through Blackboard and [http://Prezi.com](http://Prezi.com) if used.

ACADEMIC INTEGRITY
I personally support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one’s own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: [http://www.gwu.edu/~ntegrity/code.html](http://www.gwu.edu/~ntegrity/code.html)

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM

**DISABILITY SUPPORT SERVICES (DSS)**
Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Marvin Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information please refer to: [http://gwired.gwu.edu/dss/](http://gwired.gwu.edu/dss/)

**UNIVERSITY COUNSELING CENTER (UCC) 202-994-5300**
The University Counseling Center (UCC) offers 24/7 assistance and referral to address students' personal, social, career, and study skills problems. Services for students include: crisis and emergency mental health consultations, confidential assessment, counseling services (individual and small group), and referrals [http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices](http://gwired.gwu.edu/counsel/CounselingServices/AcademicSupportServices)

**SECURITY:** In the case of an emergency, if at all possible, the class should shelter in place. If the building that the class is in is affected, follow the evacuation procedures for the building. After evacuation, seek shelter at a predetermined rendezvous location.