Quantitative evidence has become increasingly important for developing solutions to challenging public problems. However, statistics rarely if ever “speak for themselves.” If poorly generated, they mean nothing, or worse, can do great harm. If poorly presented and explained, they can misinform, mislead, or confuse their audiences. Thus, knowing how to create, interpret, and present quantitative evidence are essential skills for anyone beginning a career in public policy. Even if you never personally generate statistical results after you leave William and Mary, you will inevitably have to evaluate the quantitative findings of others.

With that preface, let me welcome you to PUBP 602. This class serves three important purposes. First, it provides an introduction to applied statistical methods. Second, it prepares students for more advanced statistics courses. Finally, and most importantly, it will help you develop the habits of mind that will make you careful practitioners of statistical computing. In short, statistical analysis is not a spectator sport, so in this class you will develop quantitative skills by actually practicing them.

Some of you may possess little or no quantitative background. That’s okay. The work is challenging, but not impossible. If you already have statistical experience, you will still gain much from the course’s emphasis on communicating statistical results to non-specialists.

**COURSE MATERIALS**

These books are available at the William and Mary Bookstore, required books are starred (★).


These great supplemental references are free.
UCLA Academic Technology Services. Resources to help you learn and use Stata.  
http://www.ats.ucla.edu/STAT/stata/.

We will use the software program Stata in this class. I strongly urge you to purchase the program. It is an investment that will pay many dividends during your time at William and Mary and beyond. To purchase the program at a discounted rate through the Stata GradPlan:


• On that page, I would recommend purchasing Stata/IC 10 with a perpetual license and the *Getting Started* manual (product code SWCSC0FTGS). The price is $155.00

• Do NOT buy Small Stata 10. It has very limited capabilities.

• Pick up your order at the Information Technology office in Jones Hall, next to Morton.


**Requirements & Grades**

Grades for this course will be based on 4 homework assignments, 2 exams, a final paper and class participation. Due dates and percent of grade are shown below. You need to complete all items to receive course credit, otherwise you will receive a grade of incomplete.

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Due Date</th>
<th>Grade Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Homework 1</td>
<td>9/17</td>
<td>5%</td>
</tr>
<tr>
<td>Homework 2</td>
<td>10/3</td>
<td>5%</td>
</tr>
<tr>
<td>Exam 1</td>
<td>10/9</td>
<td>25%</td>
</tr>
<tr>
<td>Homework 3</td>
<td>11/5</td>
<td>5%</td>
</tr>
<tr>
<td>Homework 4</td>
<td>11/19</td>
<td>5%</td>
</tr>
<tr>
<td>Exam 2</td>
<td>11/25</td>
<td>25%</td>
</tr>
<tr>
<td>Final Paper</td>
<td>12/16</td>
<td>20%</td>
</tr>
<tr>
<td>Class Attendance and Participation</td>
<td>10%</td>
<td></td>
</tr>
</tbody>
</table>

Due dates for the assignments are listed above. **These are strict deadlines.** Once the due date has passed, it is inappropriate to ask me to accept your late paper. However, if you are struggling with an assignment, I encourage you to speak to me about it before the due date so that I can help you decide where to focus your energies. If your assignment is incomplete at the time it is due, please turn in what you have accomplished at that point to ensure that you receive credit for the work that you have done. It does not matter how incomplete your work is; just turn in any work that you have done. Only well-documented extenuating circumstances qualify for an exception, and then only at my discretion. If you envision having a problem, it is far better to bring this up before the fact rather than after, in which case there is little that can be done.

Grades will be based on the following percentage scale:

- A=93-100
- A-=90-92
- B+=88-89
- B=83-87
- C+=78-79
- C=73-77
- D+=68-69
- D=63-67
- F<60

In a graduate class such as this, any grade below a “B” suggests that a student is having trouble grasping basic course ideas, which are essential building blocks for future courses and the work world. Please talk with me if you find yourself having difficulty.

Finally, because error sometimes creeps into grade calculations (and on rare occasions assignments are misplaced after they have been handed in) please keep a copy of all work submitted for this course until final grades have been processed.

**Assignments:** Homework assignments will focus on real life policy questions. It is crucial that you complete these assignments on time. Grading will stress two things: (1) the degree to which you have made a strong effort to complete all parts of each assignment; and (2) the extent to which your work, especially the statistical computing component, is polished and professionally done.

When working on the homework, please do not use previous students’ graded assignments for help. I do, however, strongly encourage you to work on these exercises in concert with your peers. In the end, though, each person’s homework must be a personal product.

**Exams:** We will have two take-home exams. Both will ask you to perform calculations and will emphasize interpreting results. The exams will be open-book and open-note.

**Final Paper:** The course’s capstone paper will provide an opportunity for you to use your quantitative skills in an area of your choosing. I will make some data sets available, but you may also use data from another source. More details about the paper will be forthcoming.
**Daily Class Operations**

You will develop professional habits and get the most out of class by doing these things:

*The night before class:*
- Do the readings. Even skimming the relevant pages for 15 minutes will be worth it. Do not expect to understand the material after only one read.
- Check Blackboard for files to download for class
  - Download data sets and Stata .do files to your laptop or your personal H:\ drive
  - *Print out the .pdf handouts that I post to Blackboard*
- Charge your laptop battery. Unfortunately, outlet power is not always conveniently located in our classroom, so don't rely on plugging in your machine during class.

*Before lecture begins:*
- Arrive on time and be embarrassed if you are late.
- Have Stata running on your laptop computer, or be sitting next to someone who does.
- Close your email and Internet entertainment, and disable all instant messaging software.

*During class:*
- Ask questions when you do not understand something.
- Do not check email, send or read instant messages, or surf the Internet.

Note: Your laptops will be powerful educational tools for this class. However, do not let them distract you, your fellow classmates, or me from our in-class work. Students who use laptops in class for email, Internet entertainment, instant messaging, or similar purposes suggest that they possess neither the intellectual focus nor the respect for others needed to do professional work. Those students end up developing reputations that make it difficult for faculty members to give them strong recommendations to other professors or future employers.

I begin each semester by assuming that academic misconduct will not be an issue, but, as a policy matter, I mention this on every syllabus. For any questions about policies regarding cheating, plagiarism, or other types of misconduct, please refer to the web site of the William and Mary Honor Council and the relevant pages about the Honor Code from the Student Handbook. If I discover a student violating the Honor Code, I will initiate an Honor Council proceeding and, at a bare minimum, recommend to the Council that the student receive an “F” for the course. I take this issue extremely seriously, and hope you do too.

**Ask questions.** I do not think it is possible to learn statistics without asking questions. Consequently, I expect you to ask many questions during class. Note that if you are at all confused, you can generally assume that others are confused as well and that they would benefit equally from hearing your questions answered. That said, I also welcome questions outside of class. So, if you have any questions at all about the course please *do not hesitate* to get in touch with me or Brett. Office hours are a good time, but we will also be available on an appointment basis—feel free to make arrangements. If you have any last-minute or late-night questions, email is the best way to go. I will do my best to respond within 24 hours.

**What you can expect from me:** So far I have covered a lot about what I expect from you. A fair question, though, is: What can you expect from me? First, and above all, I will not ask you to do things that waste your time. In fact, everything I will teach or require of you is based on practices of the best professional policy analysts and academic researchers. In my own work I try to live up to the standards I will be teaching you. Second, Brett and I will offer lots of honest feedback in office hours, via email exchanges, and on your written work. If our comments seem confusing, harsh, or unclear, let’s talk it over. Finally, I promise to treat you and your ideas with fairness and respect. I will not penalize you if you do not embrace my views; nor will I reward you if we happen to agree on political or policy matters.
COURSE OUTLINE AND READINGS
Note: the reading assignments intentionally repeat for some days.

Thursday, August 28  No Class: APSA Meeting

Tuesday, September 2  Overview
• Welch and Comer, Ch. 1 and Ch. 2 (pp. 9-15)
• Optional, but encouraged: Miller, Ch. 1 and 2

Thursday, September 4  Stata Basics
• Acock, Ch. 1-4
• Optional, but encouraged: Getting Started with Stata Release 10, Ch. 4, 10, 12-14, and 17
  (This book came with your Stata software.)

Tuesday, September 9  Univariate Statistics
• Welch and Comer, Ch. 3 (pp. 38-52) and Ch. 5 (pp. 119-129)

Thursday, September 11  Univariate Data Presentation
• Welch and Comer, Ch. 5 (pp. 106-118, and example 5B on pp. 120-1)
• Acock, Ch. 5
• Optional, but encouraged: Getting Started with Stata Release 10, Ch. 15-16

Tuesday, September 16  Introduction to Probability
• Moore and McCabe, Introduction to the Practice of Statistics, 5th edition. (pp. 259-271
  and 315-319) ON BLACKBOARD

Wednesday, September 17  HOMEWORK #1 DUE by 6pm

Thursday, September 18  Univariate Probability Distributions
• Welch and Comer, Ch. 5 (pp. 128-134)

Tuesday, September 23  Population, Sample, and Sampling Distributions
• Welch and Comer, Ch. 7 (pp. 167-184; stop at “... called a standard error of the mean.”
  Note: pp. 181-184 is especially important.)

Thursday, September 25  The Three Distributions, cont’d
• Review Tuesday’s reading

Tuesday, September 30  Introduction to Hypothesis Testing: One-sample T-test
• Welch and Comer, Ch. 7 (pp. 181-201)

Thursday, October 2  Confidence Intervals & Two-sample T-test
• Welch and Comer, Ch. 7 (pp. 200-205)
• Acock, Ch. 7 (pp. 131-141)

Friday, October 3  HOMEWORK #2 DUE by 6pm

Tuesday, October 7  Review for Exam
Thursday, October 9  
No Class: TAKE HOME EXAM #1 DUE by noon

Tuesday, October 14  
No Class: Fall Break

Thursday, October 16  
No Class: Washington Program

Tuesday, October 21  
Introduction to Bivariate Analysis: Contingency Tables
- Welch and Comer, Ch. 6 (pp. 135-142)

Thursday, October 23  
Contingency Tables & Chi-square Test
- Welch and Comer, Ch. 6 (pp. 149-151) and Ch. 7 (pp. 206-7)
- Acock, Ch. 6 (pp. 102-109)

Tuesday, October 28  
Scatterplots & Correlation Coefficient
- Welch and Comer, Ch. 8 (pp. 226-227); stop before discussion of "r^2".

Thursday, October 30  
Correlation Coefficient cont’d
- Review Tuesday’s reading

Tuesday, November 4  
In Class Exercise Set-up

Wednesday, November 5  
HOMEWORK #3 due by 6pm

Thursday, November 6  
In Class Exercise

Tuesday, November 11  
Bivariate Regression I
- Welch and Comer, Ch. 8 (pp. 212-234)
- Acock, Ch. 8 (pp. 149-167). Note: You can skim the parts we’ve already read

Thursday, November 13  
Bivariate Regression II
- Review Tuesday’s reading

Friday, November 14  
HOMEWORK #4 due by 6pm

Tuesday, November 18  
Bivariate Regression III
- Welch and Comer, Ch. 8 (pp. 212-234)
- Acock, Ch. 8 (pp. 149-167)

Thursday, November 20  
Review for Exam

Tuesday, November 25  
No Class: TAKE HOME EXAM #2 DUE by noon

Thursday, November 27  
No Class: Thanksgiving Break

Tuesday, December 2  
Introduction to Multiple Regression
- Welch and Comer, Ch. 9 (pp. 236-249)
- Acock, Ch. 10 (pp. 211-216)

Thursday, December 4  
In Class Guided Work