

**Public Affairs 818:**  
**Introduction to Statistics Methods for Public Policy Analysis**  
**Fall 2018**

**Professor:** Geoffrey L. Wallace

**Office:** 202 La Follette

**Email:** [wallace@lafollette.wisc.edu](mailto:wallace@lafollette.wisc.edu)

**Phone:** (608) 265-6025 (office), (608) 213-8461 (cell, before 9pm)

**Office Hours:** Friday 9-11 AM (tentative) or by appointment

**Course Website:** Learn@UW

**Teaching Assistant:** Hyunseok Kim

**Office:** 319 Taylor Hall

**Email:** [hkim659@wisc.edu](mailto:hkim659@wisc.edu)

**Office Hours:** Tuesday 2:30-4:00 PM, Thursday 2:30-4:00 PM, or by appointment

**Class Meeting Times:**

**Lecture:** Biochemistry 1120, 9:30 AM – 10:45 AM, Mondays and Wednesdays

**Discussion 301:** Wednesday, 6:15 PM to 7:05 PM, Social Science 6116

**Discussion 302:** Thursday, 12:05 PM to 12:55 PM, Ingraham 122

**Discussion 303:** Thursday, 11:00 AM to 11:50 AM, Ingraham 122

**Course Description:** This course will cover the basics of probability, statistics, and quantitative methods with an emphasis of conferring an understanding of statistical inference and its applications to economic and public policy analysis and problems.

**Required Text:** Anderson, David R., Sweeney, Dennis J., and Thomas A. Williams (2012) Modern Business Statistics with Microsoft Excel, (4th edition), Southwest-Western College Publishing.

**ISBN-10:** 0538479752, **ISBN-13:** 9780538479752 (hereafter ASW)

Textbooks are expensive. To save you some money I have opted to use a prior edition textbook. On Amazon the used versions of the 4<sup>th</sup> edition of ASW's Modern Business Statistics are now selling for \$4.00 and up. You may also opt to buy a book from a continuing student.

**Optional Texts:** Students who would appreciate a more light-hearted approach to statistics might benefit from purchasing The Cartoon Guide To Statistics by Larry Gonick and Woollcott Smith (hereafter CGS).

**Calculator:** Any calculator will suffice including smart phone calculators. This said there may be some advantages to using a graphing-type calculator. These advantages the ability to evaluate log and exponential expressions and enter (and see) more complicated expressions. I personally use a graphing calculator developed by Appcylon for IOS devices (and Windows phones), but there are others available.

**Required Software:** Access to Microsoft Excel and STATA. STATA may be accessed a number of ways. The first method for accessing STATA is through the Social Science Computing Cooperative's (SSCC) Winstat servers. All students in the class will receive a one-semester Winstat account from SSCC. Both STATA and Excel are installed on the Winstat server and on

computers in the SSCC computer labs. STATA is available for download free of charge for personal computers at the [campus software library](#). After clicking on the link select "University of Wisconsin - Madison", and log in using your NetID and password. Lastly, STATA installed on all the computers in the La Follette computer lab.

**Course Requirements:** Students are expected to attend all lectures and discussions sessions. In addition, students will be responsible for the completion of weekly problem sets. These problem sets will be graded using a check+, check, check- grading scale. Students are encouraged to work in groups on problem sets, but each student must turn their own work. Under no circumstance will late homework be accepted. The problem sets will account for 20 percent of the grade and are intended to provide intensive practice in applying the tools developed in lecture. You should look at homework as an opportunity to make some mistakes and learn from them. My expectation is that you put time and effort into completing assignments, but I do not expect that completed assignments will be perfect and error free.

**Discussion Sections:** All students enrolled in this class should be assigned to a discussion section with a teaching assistant. These discussion sections will meet once a week throughout the course of the semester. In discussion sections, the problem sets from the previous week will be reviewed, old material may be rehashed, questions will be answered, and, on occasion, new material will be presented. To get the most out of the course attendance and active participation in these discussion sections will be vital. Subject to space constraints, and regardless of your enrollment status, you may attend any discussion of the three discussion sections.

**Quiz and Exams:** There is a quiz, a midterm examination, and a final. Both the quiz and the midterm are scheduled during regular class hours. The quiz in mid-October, Wednesday October 17<sup>th</sup>, will cover material on probability and distributions from chapters 4, 5, and 6 of the text. The midterm exam, scheduled for the Wednesday before Thanksgiving, November 21<sup>st</sup>, will cover material on sampling, sampling distributions, and statistical inference from chapters 7, 9 and 10 of the text. The final examination is cumulative and will take place on **Friday December 14<sup>th</sup> from 7:45 AM to 9:45 AM** (room TBA).

**Grades:** The following weights will be used in computing your final grade

STATA Assignment . . . . .	10 percent
Quiz. . . . .	10 percent
Midterm Exam. . . . .	20 percent
Final Exam . . . . .	30 percent
Weekly Homework . . . . .	20 percent
Class Participation . . . . .	10 percent

If you have any questions or concerns about how your assignment or exams are graded please send an email to Hyunseok Kim ([hkim659@wisc.edu](mailto:hkim659@wisc.edu)) detailing your concerns.

## Tentative Class Schedule and Assigned Readings

Dates	Topics	Readings (CGS optional)
<b>Data and Descriptive Statistics</b>		
Sept. 5	Syllabus, Data and Statistics	ASW 1
Sept. 10	STATA Basics, Tabular and Graphical Descriptive Techniques for Categorical Data (bar graphs and pie charts)	ASW 2.1
Sept. 12	Tabular and Graphical Descriptive Techniques for Categorical Data (bar Graphs and pie charts) / Graphical Descriptive Techniques for Interval Data	CGS (pp. 7-13), ASW 2.2
Sept. 17	Graphical Descriptive Techniques for Interval Data, Descriptive Statistics (central location)	CGS (pp. 14-18), ASW 2.2-2.4, 3.1
Sept. 19	Descriptive Statistics (variability) Measures of Relative Standing, Measures of the Association between Two Variables	CGS (pp. 19-26), ASW 3.2-3.5
<b>Sept. 21</b>	<b>Optional help for STATA Assignment in 3218 Social Sciences from 4-6 PM.</b>	
<b>Sept. 24</b>	<b>STATA Assignment Due</b>	
<b>Probability</b>		
Sept. 24	Introduction to Probability (properties, basic rules) Bayes' Theorem	CGS (pp. 27-45), ASW 4.1-4.4
Sept. 26	Bayes' Theorem, Discrete Random Variables and Probability Distributions, Expected Value and Variance	CGS (pp. 46-52), ASW 4.5, CGS (pp. 53-62), ASW 5.1-5.3
Oct. 1	Properties of Expected Value and Variance, The Binomial Distribution	CGS (68-72), CGS (pp. 73-78), ASW 5.4
Oct. 3	The Hypergeometric Distribution Continuous Probability Distributions, The Uniform Distribution, The Normal Distribution	ASW 5.6, ASW 6.1, CGS (pp. 79-88), ASW 6.2
Oct. 8	The Standard Normal Distribution, The Standardizing Transformation	ASW 6.2

## Tentative Class Schedule and Assigned Readings (continued)

Dates	Topics	Readings
<b>Statistical Inference</b>		
Oct. 10	Sampling and Sampling Distributions	CGS (pp. 89-110), ASW 7
Oct. 15	Point and Interval Estimation	ASW 7.3, CGS (pp. 111-136), ASW 8
<b>**Quiz – Wednesday October 17 (room TBA) – Covers chapters 4, 5, and 6 of the text</b>		
Oct. 22	Statistical Inference – One Sample, Interval Estimation, One-Sample Hypothesis Testing	ASW 8, CGS (137-156), ASW 9
Oct. 24	One-Sample Hypothesis Testing	CGS (137-156), ASW 9
Oct. 29	Statistical Power and the Probability of Type II Errors	
Oct. 31	Statistical Inference – Two Samples Sampling Distributions, Interval Estimation, Hypothesis Testing	CGS (pp. 157-180), ASW 10
Nov. 5	Statistical Inference – Two Samples, Examples	
Nov. 7	Statistical Inference – Two Samples, Examples	
Nov. 12	Statistical Inference – Two Samples, Examples	
<b>Regression Analysis</b>		
Nov. 14	Scatter plots, Covariance, Correlation / Bivariate regression	ASW 2.4, ASW 3.5, ASW 14
Nov. 19	Bivariate Regression / Review	ASW 14
<b>**MIDTERM – Wednesday November 21 (room TBA)</b>		
Nov. 26, 28	Multivariate Regression	ASW 15
Dec. 3, 5	Human Capital Model	ASW 15, ASW 16.1
Dec. 10	Human Capital Model	ASW 15, ASW 16.1
Dec. 12	Slack/Review	
<b>**FINAL EXAM – Friday December 14<sup>th</sup> from 7:45 AM to 9:45 AM (room TBA)</b>		