

# STAT22000 Section 01 Winter 2014 Syllabus

## Instructor

**Xiang Zhou**    MWF 10:30-11:20am  
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## Course Assistants

- Mohammad Jahangoshahi – mjahangoshahi20@gmail.com
- Ken Wong – kenwong@uchicago.edu

## Course Prerequisite

STAT22000 has a math prerequisite of 2 quarter of single-variable calculus (MATH 13100-13200, 15100-15200 or 16100-16200). If you have AP Calculus credit for these prerequisite courses, you may also enroll.

In this course, you will need to do

- differentiation
- integration
- finding area under a curve (using tables or software)
- summation notation
- log, exponential functions
- basic algebra, equation of straight lines, square root
- analysis of problems, scientific reasoning (not just “plug-n-chug”)

## Course Description

This course introduces statistical techniques and methods of data analysis, including the use of computers. Examples are drawn from biological, physical, and social sciences. Students are required to apply the techniques discussed to data drawn from actual research. Topics include data description, graphical techniques, exploratory data analysis, random variation and sampling, one- and two-sample problems, linear regression, analysis of variance, and analysis of discrete data.

## Tentative Schedule

Week	Date	Topic	Chapter	HW due
1	Mon Jan 6 Wed Jan 8 Fri Jan 10	Introduction, Graphical Display of Data Numerical Descriptions of Data Densities and Normal Distributions	1.1 1.2 1.3	HW1 due
2	Mon Jan 13 Wed Jan 15 Fri Jan 17	Scatter plot and Correlation Least Squares Regression Regression, Residuals, Outliers	2.1,2.2 2.3 2.4	HW2 due
3	Mon Jan 20 Wed Jan 22 Fri Jan 24	<i>No class - MLK Day</i> Experiments and Observational Studies Sampling, Bias and Variance	3.1,3.2 3.3,3.4	HW3 due
4	Mon Jan 27 Wed Jan 29 Fri Jan 31	Probability Introduction Probability Rules Random Variables	4.1,4.2 4.5 4.3	HW4 due
5	Mon Feb 3 Wed Feb 5 Fri Feb 7	Random Variables Continued Sampling Distributions Central Limit Theorem	4.3,4.4,5.1 5.1 5.2	HW5 due
6	Mon Feb 10 Wed Feb 12 Fri Feb 14	Confidence Intervals Midterm Review <b>Midterm exam:</b> 5:00 - 7:00 in Eck133 <i>No class - College Break</i>	6.1	
7	Mon Feb 17 Wed Feb 19 Fri Feb 21	Hypothesis Testing Type I and Type II Error Student $t$ -Test	6.2,6.3 6.4 7.1	HW6 due
8	Mon Feb 24 Wed Feb 26 Fri Feb 28	Comparing Means Inference for Proportions Inference for Two-way Tables	7.2 8.1,8.2 2.5, 9.1-9.2	HW7 due
9	Mon Mar 3 Wed Mar 5 Fri Mar 7	Simple Linear Regression Simple Linear Regression Continued Analysis of Variance	10.1 10.2 11.1	HW8 due
10	Mon Mar 10 Wed Mar 12 Fri Mar 14	Multiple Linear Regression Summary and Review <i>No class - Reading Period</i>	12.1	
	Mon Mar 17	<b>Final exam:</b> 10:30 - 12:30 in Eck133 (may change)		

## Course Webpage

- **Chalk:** <http://chalk.uchicago.edu>
  - Check often! Handouts/HWs/solutions/announcements are posted here
- [http://home.uchicago.edu/xz7/course/2014win\\_stat220.html](http://home.uchicago.edu/xz7/course/2014win_stat220.html) — for guest only

## Office Hours & Problem Sessions

Time	Room	Type	Lead By
Wed 5-6pm	Eck117	Problem Session	CAs
Thu 6-7pm	Eck133	Problem Session	CAs
Wed 4-5pm	Eck131	Office Hour	CAs
Fri 4-5pm	Eck131	Office Hour	Xiang Zhou

- Appointments available upon request
- Attendance to the problem sessions are optional

## Textbook

Moore, D. S., McCabe, G. P. and Craig, B. (2010).  
*Introduction to the Practice of Statistics*, **7th edition**.  
W. H. Freeman and Company, New York.

## Software

- We will mostly use R and calculators. R is available for FREE at: [www.r-project.org](http://www.r-project.org).
- “A (Very) Short Introduction to R” by Torfs and Brauer:

<http://cran.r-project.org/doc/contrib/Torfs+Brauer-Short-R-Intro.pdf>

- The first two problem sessions (Jan 8/9) will be devoted to introduction to R.
- Regenstein TECHB@R provides useful technical support for R

<https://itservices.uchicago.edu/page/techbr>

## Grade Components

- Homework (30%): Lowest will be dropped
- Midterm (30%)
- Final (40%)
- We do not curve.
- Exams are closed-book. You should bring a **calculator**.
- You can bring one letter-sized formula sheet for the midterm and two letter-sized formula sheet for the final.

## Final Grade Options

- A Quality Grade (A, A-, B+, B, B-, C+, C, C-, D+,D, or F) will be given unless the student has registered for the grade of R (auditing) or arranges a P/F, I or W grade as outlined below.
- A P/F (Pass/Fail) grade or W (Withdrawal) may be given upon written request to the instructor (email is fine) **before the final exam starts**. The grade of P will be awarded only for work of C- quality or better.
- The grade I (Incomplete) will be given only in clear cases of emergency and must be approved by the department chair.

## Homework Policies

- Due Friday at the **beginning** of class
- Solutions will be posted on chalk before **5pm on the due day**;
- **No Late Homework!**
- **Collaboration:** You may discuss with other students with the following restrictions:
  - You must make an honest attempt at homework problems before discussing them with anyone else.
  - You must **do the final write-up independently in your own words, and do your own computer work**
  - You may compare final answers with others to check for mistakes.
  - If you receive substantial help on a problem, you must acknowledge it.
- Homework must be **stapled** and include **your name as the one on chalk** (no nickname please).
- Homework must be coherent and legible. Graphs must be properly labeled. CAs may deduct points for poorly presented solutions.
- Please show your work to get full credits.
- No credit will be given for doing incorrect problems/using wrong editions of the book.
- You are encouraged to make sure your exams and assignments are graded accurately. This includes checking if correct answers were mistakenly marked wrong or if points were added incorrectly.

## Other Undergraduate Statistics courses

See the overview of all undergraduate Statistics courses:

<http://statistics.uchicago.edu/teaching/courses.html>

or talk to the Director of Undergraduate Studies, Linda Brant Collins (lcollins@uchicago.edu), in Eck107. Students considering a major or minor in Statistics should communicate directly to Linda, too.