



Shanghai Jiao Tong University

EC313 Introduction to Statistics

Instructor:	Gexin Yu	Email:	gyu@wm.edu
Home Institution:	College of William and Mary	Office:	TBD
Office Hours:	TBD		
Term:	2 July- 2 August, 2018	Credits:	4
Classroom:	TBD	Teaching Assistant(s):	TBD
Class Hours:	Monday through Thursday, 3.20-5.20 pm		
Discussion Session:	2 hours each week, led by teaching assistant(s)		
Total Contact Hours:	66 contact hours (1 contact hour = 45 mins, 3000 mins in total)		
Required Texts (w/ ISBN):	Business Statistics—A First Course, David Levine, Kathryn Szabat, and David Stephan, 7th edition (global edition), ISBN 10: 1-29-209593-8. ISBN 13: 978-1-292-09593-6 (Print) ISBN 13: 978-1-292-09602-5 (PDF)		
Prerequisite:	N/A		

Course Overview

This course is an introduction to the basic concepts and procedures behind probability and statistics. Some of the topics covered are descriptive statistics, experimental design, regression, probability, discrete random variables including the binomial distribution, the normal distribution, confidence intervals, hypothesis tests for a single parameter, inference on two samples and the chi-square distribution to test goodness-of-fit and independence.



Grading Policy

Homework and quizzes: 30%

Midterm exam: 30%

Final exam: 40%

- ✧ **Homework:** Homework problems will be assigned for each section we cover, but will not be collected or graded.
- ✧ **Quizzes:** We will have two quizzes every week (only one in the weeks with exams). Quiz problems are taken from homework problems. No make-up quiz will be given. Your lowest quiz grade will be dropped.
- ✧ **Exam:** There will be one midterm exam, at the beginning of the third week. There will also be a comprehensive final exam at the end of our session. Please tell me as soon as possible if you have a conflict.
- ✧ **Calculator:** A calculator is necessary for this course. A graphing calculator is ideal, but not required.

Your letter grade will be assigned according the following scale:

Number grade	Letter grade	GPA
90-100	A	4.0
85-89	A-	3.7
80-84	B+	3.3
75-79	B	3.0
70-74	B-	2.7
67-69	C+	2.3
65-66	C	2.0
62-64	C-	1.7
60-61	D	1.0
≤59	F (Failure)	0

Academic Honesty

The highest standards of academic integrity are enforced for this course. You may (actually are encouraged to) work together on your homework problems, but you are allowed to get help on your quizzes or exams from your classmates or any other resources. Failure to abide the rule will result in a failing grade for your coursework.



Course Schedule

Date	Lecture	Chapter
WEEK 1		
2-Jul	Introduction, Defining and collecting data	Chap. 1
3-Jul	Organizing and visualizing variables	Chap. 2
4-Jul	Numerical descriptive measures	Chap. 3
5-Jul	Basic Probability	Chap. 4
WEEK 2		
9-Jul	More on Probability	Chap. 4
10-Jul	Discrete Probability Distribution	Chap. 5
11-Jul	The normal Distribution -1	Chap. 6
12-Jul	The normal Distribution -2	Chap. 6
WEEK 3		
16-Jul	Midterm exam	
17-Jul	Sampling Distribution	Chap. 7
18-Jul	Confidence interval estimation-1	Chap. 8
19-Jul	Confidence interval estimation-2	Chap. 8
WEEK 4		
23-Jul	Fundamentals of Hypothesis testing: one sample tests	Chap. 9
24-Jul	Two-sample tests and one-way ANOVA -1	Chap. 10
25-Jul	Two-sample tests and one-way ANOVA -2	Chap. 10
26-Jul	Chi-square Tests	Chap. 11
WEEK 5		
30-Jul	Simple linear regression -1	Chap. 12
31-Jul	Simple linear regression -2	Chap. 12
1-Aug	Multiple Regression (if time permits)	Chap. 13
2-Aug	Final Exam	



More detail topics:

1. Defining and collecting data:

how to define and collect data, identify the ways to collect a sample (completely randomized design, randomized block design), and understand the types of survey errors.

2. Organizing and visualizing data:

Methods to organize and visualize variables, principles of proper visualizations

3. Numerical descriptive measures:

Describe the properties of central tendency, variation, and shape in numerical variables, covariance and the coefficient of correlation

4. Basic probability:

Basic probability concepts, conditional probability, Bayes' rules, counting rules

5. Discrete probability distributions:

Properties of probability distribution, expected value and variance, binomial distribution and Poisson distribution

6. Normal Distribution:

Continuous probability distribution, normal distribution, evaluating normality

7. Sampling distributions

Sampling distributions, probability related to the sample mean and the sample proportion, Central Limit Theorem

8. Confidence Interval Estimation

Confidence interval estimate for the mean and for the proportion

9. Fundamentals of Hypothesis Testing: One-sample tests

Fundamentals of hypothesis-testing methodology, t-test. One-tail test, Z test

10. Two-sample Tests and One-way ANOVA

Comparing the means of two independent or two related populations, compare the proportions and variances of two independent populations, One-Way ANOVA, F-test for the ratio of two variances

11. Chi-square tests

Chi-square test, the Goodness-of-Fit Test, the Chi-square test of independence and homogeneity

12. Simple Linear Regression

Least-square method, measures of variation, assumption of regression, residual analysis, inferences, estimation of mean values and prediction of individual values

13. Multiple Regression

Develop a multiple regression model, interpret the regression coefficients, coefficient of multiple determination, overall F test, ANOVA, residual analysis and inference, Dummy variable and interaction terms