STAT 111 – Summer 2019

INFORMATION AND SYLLABUS

Lecturer: Ruoqi Yu

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Office: Room 462 John M. Huntsman Hall, 3730 Walnut Street

Course Title: INTRODUCTORY STATISTICS.

Lectures: There is only one section for this class. Lectures are scheduled five days each week; Monday through Friday 11:00AM – 12:45 PM from May 28 to July 3. The lectures are given in JMHH F38.

Every lecture is important.

Daily attendance will be taken at the end of each lecture.

Emailing is the most efficient way to get in contact with the instructor outside of the class. When emailing, please start the subject line of the email with "STAT111:".

Office Hours: Office hours will be held after every lecture until 1pm in the classroom.

Textbook: The most relevant materials for the course are the class notes, which will be posted on the course webpage (see below). **It is highly recommended that you take detailed notes during the class.** There is **no required textbook** for the class. However, the suggested book for the course is Downing and Clark, "E-Z Statistics", Barron, 2009, ISBN 13: 978-0-7641-3978-9.

Course Webpage: We are going to be using online system "Canvas". Canvas is available to all Penn students at https://canvas.upenn.edu using pennkey authentication (username and password). Canvas page will have all the class materials and grades throughout the semester.

For getting access to various electronic documents of the course, use the "Files" link on the canvas page. For point score information, use the "Grades" link on the canvas page.

For technical questions about using Canvas you can contact the Wharton Student Computing support office at 215 898 8600 or at https://computing.wharton.upenn.edu/ .

Homeworks: To keep up with the pace of the class, we are going to have 4 **weekly homework assignments**. The homework assignment will be due every Monday unless otherwise instructed in class. Note that not all questions will be graded, but the full solution will be posted on the course website.

Assessment:

- Attendance: 15%
- Homeworks: 4*5% (due on June 3, June 10, June 24, July 1)
- Midterm: 25% (June 14)
- Final (July 3): 40%

The easiest way to earn points for the class is to attend the lectures.

From time to time there will be chances to earn extra credits.

Midterm exam will be on June 14 in class.

Final exam will be on July 3 (the last day of the classes) in class.

Classroom expectations

- You are expected to arrive at least 2 minutes before scheduled time and participate during the whole time of the lecture.
- It is highly recommended that you take detailed note during the class.
- Daily attendance will be taken at the end of each lecture.

Course Description: The content of this course falls into two broad categories, namely Probability theory and Statistics. The reason why we discuss probability theory will be given in the first lecture. A more detailed list of the topics covered within these two categories is given in the syllabus below. The aim of the course is to give you an introduction to the concepts in probability and provide you with a basic idea of statistical inference.

JMP: The course will in part be given in association with use of the statistical package JMP. You should either buy and then install this package on your computer or (a better option, since buying JMP is expensive) use the Wharton computers that have it installed.

If you decide to choose the second option, it might be helpful to check out the Wharton Virtual Lab feature which allows you to use the Wharton computing environment remotely from your laptop: http://supportcenteronline.com/link/portal/632/655/Article/5657/5a-Virtual-Lab-for-Laptops Alternatively Penn students can get a JMP license through e-academy at http://www.onthehub.com/jmp/ for $30 for a 6 month license or $50 for a year license.

You will not be able to use Wharton computers until you have created a Wharton account. If you are a non-Wharton student please create a class account at:

https://whartonstudentsupport.zendesk.com/hc/en-us/articles/202127736-Creating-a-Wharton-CLASS-Account

SYLLABUS

The effective syllabus of the course will be whatever is covered in the class. But the following is the general guideline for the course.

INTRODUCTION

1. Statistics and Probability Theory
   - 1.1 What is Statistics?
   - 1.2 The relation between probability theory and Statistics

PROBABILITY THEORY

2. Events
   - 2.1 What are events?
   - 2.2 Notation
   - 2.3 Unions, intersections and complements of events

3. Probability of Events
   - 3.1 Probabilities of derived events
   - 3.2 Independence of events

4. Probability: One Discrete Random Variable
   - 4.1 Random variables
   - 4.2 Random variables and data
   - 4.3 The probability distribution of a discrete random variable
   - 4.4 Parameters
   - 4.5 The Binomial distribution
   - 4.6 The mean of a discrete random variable
   - 4.7 The variance of a discrete random variable

5. Many random variables
   - 5.1 Introduction
   - 5.2 Notation
   - 5.3 Independently and identically distributed (iid) random variables
   - 5.4 The mean and variance of a sum and an average and a difference
   - 5.5 Two generalizations
   - 5.6 The proportion of successes in n binomial trials
   - 5.7 The standard deviation and the standard error

STATISTICS

11.2 Tables bigger than two-by-two
11.3 Another use of chi-square: testing for a specified probability distribution

In we have extra time, we will cover

12. The Nature of the Tests of Hypotheses Considered So Far

13. Non-parametric (= distribution-free) tests
13.1 Introduction
13.2 The Wilcoxon signed-rank test
13.3 The Wilcoxon rank-sum test
13.4 The “runs” test