UNIVERSITY OF TORONTO
DEPARTMENT OF STATISTICS

STA220H1 F - THE PRACTICE OF STATISTICS I
Summer 2017
Course Outline

LECTURES:

Lecture Times: Tuesday, 19:00 - 22:00 ES 1050

Thursday, 19:00 - 22:00 ES 1050

Instructor: Luai Al Labadi

Office Location: SS 5016H

E-mail Address: luai.allabadi@utoronto.ca

Office Hours: Monday, Tuesday, Wednesday and Thursday, 17:00 - 18:

or by appointment.

(*Office hours may change before tests and final exam*)

Course Web Site: http://portal.utoronto.ca

TUTORIALS: Tutorials start on the 2nd (i.e. May 18) evening of classes. They are held at 6:00 p.m., twice a week before each class. To find out the section and location of your first tutorial, please check on Blackboard.

Tutorial		Location	Teaching Assistants
A	Tuesday 18:00-19:00	LM 157	Boris Garbuzov
	Thursday 18:00-19:00	LM 157	
B	Tuesday 18:00-19:00	WI 523	Barton Li
	Thursday 18:00-19:00	WI 523	
C	Tuesday 18:00-19:00	WI 524	Daniel G. Cox
	Thursday 18:00-19:00	WI 524	
D	Tuesday 18:00-19:00	BA 1240	Jangho Lee
	Thursday 18:00-19:00	BA 1240	
E	Tuesday 18:00-19:00	BA 2145	Yang Guo
	Thursday 18:00-19:00	BA 2145	
F	Tuesday 18:00-19:00	BA 2155	Xing Shuo Zhai
	Thursday 18:00-19:00	BA 2155	
G	Tuesday 18:00-19:00	BA 2165	Lei Sun
	Thursday 18:00-19:00	BA 2165	

TAs Office Hours and Email Addresses: All office hours will take place in the Stats Aid Centre(SS1091).

Teaching Assistants	email	Office Hour
Boris Garbuzov	boris.garbuzov@mail.utoronto.ca	Monday 7-8pm
Barton Li	bart.li@mail.utoronto.ca	Tuesday 3-4 pm
Lei Sun	liam.sun@mail.utoronto.ca	Tuesday 4-5
Daniel G. Cox	cox@utstat.toronto.edu	Wednesday 3-4 pm
Yang Guo	ygj.guo@mail.utoronto.ca	Thursday 3-4 pm
Jangho Lee	jangho.lee@mail.utoronto.ca	Thursday 4-5 pm
Xing Shuo Zhai	xing.zhai@mail.utoronto.ca	Friday 12-1 pm

COURSE DESCRIPTION

An introductory course in statistical concepts and methods, emphasizing exploratory data analysis for univariate and bivariate data, sampling and experimental designs, basic probability models, estimation and tests of hypothesis in one-sample and comparative two-sample studies. A statistical computing package is used but no prior computing experience is assumed.

Prerequisite: Grade 12 Mathematics and one University course in the physical, social, or life sciences

Exclusion: ECO220Y1/ECO227Y1/GGR270H1/PSY201H1/SOC202H1/SOC300Y1/
STA250H1/STA261H1/STA248H1/EEB225H1

Distribution Requirement Status: None

Breadth Requirement: The Physical and Mathematical Universes (5)

TEXTBOOK

STATISTICS (13th edition) by McClave and Sincich

Publisher: Pearson Prentice Hall

Publication Date: 2017

Supplemental Materials: Student Solution Manual, Technology Manual, Minitab software

ISBN13:9780134080215

ADDITIONAL REFERENCES http://sta220.utstat.utoronto.ca/

ASSESSMENT AND DEADLINES

Type	Due date	Time	Location	Weight
Term Test (Midterm)	June/6/2017 To be confirmed	7:10-9:00	TBA	35%
Online (Portal) Quizzes: best 3 of 4				15%
Quiz 1	May/25/2017	6:45-7:00	Tutorial	
Quiz 2	June/1/2017	6:45-7:00	Tutorial	
Quiz 3	June/8/2017	6:45-7:00	Tutorial	
Quiz 4	June/15/2017	6:45-7:00	Tutorial	
Final Exam	TBA	3 hours	TBA	50%

TESTS

The term test is held from 19:10 to 21:00 on the test date. There is no extra time for late entrants.

The final exam covers material from the entire course.

Non–programmable calculators are permitted on the test and exam. A one–sided, **hand-written 8–1/2" x 11"** aid sheet is allowed in the test (two–sided on the final exam). You must bring your student identification to the term test as well as the final exam. Note: test solutions may be photocopied before they are returned.

MISSED TERM TEST POLICY

If you miss the term test for medical reasons, submit a U of T medical certificate indicating that you saw the doctor on the date of the missed test. If you miss a term test for any other reason, submit appropriate official documentation. Also **include your name, student number, and course number at the top of the page**. All documentation must be official and written in English. It is your responsibility to submit documentation to the professor within one week of the missed test. The professor determines if the absence is legitimate and is entitled to refuse your documentation if it does not meet these standards.

If you miss the term test and your absence is classified as legitimate, a make-up test will NOT be scheduled. Your final exam would account for 85% of your final grade. If your documentation is not received on time, your test mark will be zero.

TEST RE-MARK POLICY

Requests for test remarking must be made in writing. Submit a note to the instructor (not the TA) explaining why you believe your solutions deserve more marks. **Late remark requests will not be accepted.** All quizzes issues need to be discusses with your TA.

QUIZZES

Quizzes are closed book. There will be 4 quizzes. The lowest of the four quiz will be dropped. **Missed quizzes earn a mark of zero, no exceptions.** Medical certificates and/or other valid documentation are not accepted. **All quizzes issues need to be discusses with your TA**

TUTORIALS

Tutorials begin May 18. Tutorials meet every Tuesday and Thursday 18:00–19:00. Tu-

torial sections will be posted at the course web site prior to May 17. Practice problems will be assigned weekly and will be posted on the web-site. They are not to be handed in. They will be appropriate preparation for the tutorial discussion and quizzes. Bring your solutions to tutorial, along with your questions about these exercises or the related theory and concepts. Tutorials will be held on the test day.

EMAIL POLICY

Email is most appropriate for personal questions. In general, we are unable to answer technical questions about the course material by e-mail. Before you send an e-mail, make sure that you are not asking for information that is already on the course outline/ website/announcements, or questions about the course material that are more appropriately discussed during office hours. If you do not get a response, this may be why. If your question is conceptual and does not require calculations or an elaborate answer, you can ask by email. Any questions regarding the tutorials should be addressed to your TA. For all other matters, contact the instructor. Please email the instructor and TAs using your *@utoronto.ca address. The **subject line should contain the course number, lecture section number, and a relevant subject** (indicating what the email is about). Be sure to **include your full name and student number in the body of the message**. You will not get a response if you email from other email addresses or do not follow the email policy.

OFFICE HOURS

There are plenty of office hours at various days/times offered by the TAs and instructor. You may also book an appointment with the instructor if you are unable to attend the regular office hours or need extra help. The TAs and instructor are here to help you! Ask questions and let the instructor know if there are any concerns.

ACCESSABILITY NEEDS

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom, or course materials, please contact Accessibility Services as soon as possible at accessibility.services@utoronto.ca or http://www.accessibility.utoronto.ca.

ACADEMIC INTEGRITY

You are responsible for knowing the content of the University of Toronto's Code of Behaviour on Academic Matters at http://www.artsci.utoronto.ca/osai/students. If you have any questions about what is or is not permitted in this course, please do not hesitate to contact me.

STUDENT RESPONSIBILITIES

- It's up to you to know all course policies and important dates - read the course outline. It's up to you to know about any important announcements - these will come to your inbox. Check the portal regularly! Check your *@utoronto.ca inbox regularly!

- You're responsible for your own learning. We're happy to help you learn, but in the

end it's up to you! Use office hours early, and use them often. Make an appointment with the professor. Keep asking questions until you're satisfied. Ask about big concepts or small details there is no such thing as a stupid question! Always take advantage of extra help don't wait until it's too late!

- You must follow the U of T code of Behaviour - this means that cheaters will be prosecuted. The Academic Regulations of the University are outlined in the Code of Behaviour on Academic Matters. You are expected to be familiar with, and to abide by, all components of the Code of Behaviour on Academic Matters. Full details can be found online at http://www.governingcouncil.utoronto.ca/policies

What you get out of the course depends on what you put into the course!

INSTRUCTOR RESPONSIBILITIES
- Lectures will be clearly presented, organized, and have plenty of examples.

- Extra help, remedial and acceleration, is always available -- in office hours, by appointment, and by email.

- Your emails will be answered in a timely fashion.

- Every student in the class will be treated with fairness and respect. Students who wish to excel are encouraged to consult regularly with the instructor. Students who abuse the U of T code of behavior will be dealt with appropriately.

- The lecturer works closely with your TAs. TAs are trained to offer quality tutorials, create valid quizzes, and mark all work consistently and fairly.

COURSE TOPICS

Statistics, Data, and Statistical Thinking - Chapter 1
1.1 The Science of Statistics
1.2 Types of Statistical Applications
1.2 Fundamental Elements of Statistics
1.4 Types of Data
1.5 Collecting Data: Sampling and Related Issues

Methods for Describing Sets of Data- Chapter 2
2.1 Describing Qualitative Data
2.2 Graphical Methods for Describing Quantitative Data
2.3 Numerical Measures of Central Tendency
2.4 Numerical Measures of Variability
2.5 Using the Mean and Standard Deviation to Describe Data
2.6 Numerical Measures of Relative Standing
2.7 Methods for Detecting Outliers: Box Plots and z-Scores
2.8 Bivariate Data

Probability - Chapter 3
3.1 Events, Sample Spaces, and Probability
3.2 Unions and Intersections
3.3 Complementary Events
3.4 The Additive Rule and Mutually Exclusive Events
3.5 Conditional Probability
3.6 The Multiplicative Rule and Independent Events
3.8 Bayes' Rule

Discrete Random Variables - Chapter 4
4.1 Two Types of Random Variables
4.2 Probability Distributions for Discrete Random Variables
4.3 Expected Values of Discrete Random Variables
4.4 The Binomial Random Variable

Continuous Random Variables - Chapter 5
5.1 Continuous Probability Distributions
5.2 The Uniform Distribution
5.3 The Normal Distribution
5.4 Descriptive Methods for Assessing Normality

Sampling Distributions - Chapter 6
6.1 The Concept of a Sampling Distribution
6.2 Properties of Sampling Distributions: Unbiasedness and Minimum Variance
6.3 The Sampling Distribution of $\bar{x}$ and the Central Limit Theorem

Inferences Based on a Single Sample:
Estimation with Confidence Intervals - Chapter 7
7.1 Identifying and Estimating the Target Parameter
7.2 Confidence Interval for a Population Mean: Normal (z) Statistic
7.3 Confidence Interval for a Population Mean: Students t-Statistic
7.4 Large-Sample Confidence Interval for a Population Proportion
7.5 Determining the Sample Size
7.6 Confidence Interval for a Population Variance

Inferences Based on a Single - Chapter 8
8.1 The Elements of a Test of Hypothesis
8.2 Formulating Hypotheses and Setting Up the Rejection Region
8.3 Observed Significance Levels: p-Values
8.4 Test of Hypothesis about a Population Mean: Normal (z) Statistic
8.5 Test of Hypothesis about a Population Mean: Students t-Statistic
8.6 Large-Sample Test of Hypothesis about a Population Proportion
8.7 Calculating Type II Error Probabilities: More about β
8.8 Test of Hypothesis about a Population Variance

Hypothesis Testing - Chapter 9

9.1   Identifying the Target Parameter
9.2   Comparing Two Population Means: Independent Sampling
9.3   Comparing Two Population Means: Paired Difference Experiments
9.4   Likelihood Ratio Tests
9.5   Comparing Two Population Variances: Independent Sampling

Simple Linear Regression - Chapter1 1

11.1   Probabilistic Models
11.2   Fitting the Model: The Least Square Approach
11.3   Model Assumptions
11.4   Assessing the Utility of the Model: Making Inferences about the Slope β_1
11.5   The Coefficients of Correlation and Determination
11.6   Using the Model for Estimation and Prediction
11.7   Complete Example

Tentative Course Schedule.

Date	Topics
May 16	1.1-1.6
May 18	2.1-2.8
May 23	3.1-3.6
May 25	4.1-4.5
May 30	5.1-5.4
June 5	**Term test**
June 8	6.1-6.3, 7.1-7.2
June 13	7.3-7.6, 8.1
June 15	8.2-8.8
June 20	9.1-9.3, 9.5
June 22	11.1-11.6