COURSE INFORMATION

Course title:	Application of Statistics in Management		
Course code:	BABS 550	Credits:	1.5
Session, term, period:	2020S, Period 1	Class location:	On-line
Section(s):	DD1, DD2	Class times:	DD1: T/R 8 – 10 am
			DD2: T/R 10 – noon
Course duration:	Jun. 8 to Jul. 18, 2020	Pre-requisites:	n/a
Division:	Operations & Logistics	Co-requisites:	n/a
Program:	MM		

INSTRUCTOR INFORMATION

Instructor:	Dr. Jonathan Berkowitz		
Phone:	Off-campus: 604-263-1508	Office location:	My home! (At UBC, HA 475,
	UBC: Nope! (~~604-822-8431~~)		in case you're interested)
Email:	jonathan.berkowitz@ubc.ca	Office hours:	On-line, TBD

Four optional tutorials: Jun. 18, Jun. 25, Jul. 2, Jul. 9; 12:00 – 1:30 pm

COURSE DESCRIPTION

The objective of this course is to give you an understanding of how statistics operates in Business and Commerce, and how essential the basic concepts are to modern business practice. You will learn thoroughly how to think about data, data analysis, statistical inference and model-building. This course will provide the knowledge necessary for you to apply the main techniques of statistics in a wide variety of circumstances, and will enable you to assess the legitimacy and significance of the wide variety of statistical reporting you will encounter in your career and life.

Emphasis will be on applying this material in managerial settings, rather than the underlying mathematics, so all techniques will be illustrated with applications. Computations will be done primarily with Microsoft Excel. As a consulting statistician in private practice, I will share many experiences and real-life examples. I will give you practical advice on which techniques really work and what shortcuts you can take.

COURSE FORMAT

This is "work in progress." For this online version of the course, the two-hour in-person classes will be replaced by a combination of recorded (asynchronous) lectures and real-time (synchronous) classes. Recorded lectures (and notes) will be posted on Canvas and should be watched and read in advance of real-time classes, which will be held on Zoom, starting at 8 am for DD1 and 10 am for DD2, as scheduled.

Zoom classes will extend, expand, enlarge, and embellish, on the recorded lectures and notes. Class participation will be through Zoom Chat, and other forms still to be determined. There may also be some group work, in the form of one small-group project—this is still in the development stage. Four optional tutorials will give supplementary examples and assistance with assignments, Excel, exam preparation. See above for dates and times.

LEARNING OBJECTIVES

By the end of this course, students will be able to:

1. Identify types of data
2. Critically assess the validity of data sources
3. Summarize data in tables and graphs
4. Apply the principles of good graphing and appraise graphs in the literature
5. Compute and interpret numerical summaries
6. Assess bivariate relationships through scatterplots, correlation, crosstabs
7. Use the normal curve to assess data distributions
8. Use basic data transformations
9. Construct and interpret basic confidence intervals
10. Explain the logic of hypothesis testing and be able to interpret results
11. Use one- and two-sample techniques of inference
12. Recognize situations requiring statistical modeling
13. Identify, build and validate regression models
14. Choose the appropriate statistical tool from the collection of standard analytic methods

ASSESSMENTS

Summary

Component	Weight
Three assignments	45%
Project	15%
Final exam	35%
Class participation	5%
Total	100%

Details of Assessments

Assignments (3) – 15% each = 45%: will each consist of short answer questions and data sets requiring analysis. The assignments (and Excel data spreadsheets) will be done on-line in Canvas.

Project – 15%: This will be a mini-case to develop a research question, find suitable data online, create a data analysis plan, carry out the analysis and report on the results. Details will be shared when the course starts.

Exam – 35%: This will also be done online in Canvas and is fully "open book, notes, and computer." It will focus on concepts and interpretation of output. The exam combined with the "hands-on" data analysis in the assignments, will provide a comprehensive assessment of skill acquisition and ability to communicate results.

Participation – 5%: Statistics is not a "spectator" sport. Meeting the learning objectives will be enhanced by active learning through class participation. To earn the participation grade, be an active member of the class. We are developing best practices on how to do this online, through Zoom and Canvas.

LEARNING MATERIALS

Required: My notes will be posted on the course Canvas website. There is no cost.

Very strongly recommended: Textbook: Sharpe NR, De Veaux RD, Velleman PF, **Berkowitz J**. *Business Statistics; A First Course, 2nd Cdn ed.*; Pearson (2019, 2015). Cost: $100-$150.

Statistical Tools in Microsoft Excel should be sufficient for most of the calculations we will want to carry out. For the more ambitious among you, feel free to use R, SPSS or any other reputable statistical software.

COURSE-SPECIFIC POLICIES AND RESOURCES

Missed or late assignments, and regrading of assessments
Late submissions will not be accepted and will receive a grade of zero.

Academic Concessions
If extenuating circumstances arise, please contact the RHL Graduate School program office as early as reasonably possible, and submit an Academic Concession Request & Declaration Form https://webforms.sauder.ubc.ca/academic-concession-rhlee. If an academic concession is granted during the course, the student will be provided options by RHL, or by the instructor in consultation with RHL, per UBC's policy on Academic Concession.

POLICIES APPLICABLE TO COURSES IN THE ROBERT H. LEE GRADUATE SCHOOL

Attendance
Excepting extenuating circumstances, students are expected to attend 100% of their scheduled class hours. Absent students limit their own academic potential, and that of their classmates, and cause unnecessary disruption to the learning environment. Students missing more than 20% of the total scheduled class hours for a course (including classes held during the add/drop period) without having received an academic concession will be withdrawn from that course. Withdrawals, depending on timing, could result in a "W" or an "F" standing on the transcript.

Punctuality
Students are expected to arrive for classes and activities on time and fully prepared to engage. Late arrivals may be refused entry at the discretion of the instructor or activity lead. Students arriving later than halfway through a scheduled class will be treated as absent for that class.

Electronic Devices
Devices such as laptops, tablets, and cell phones are not permitted to be used in class unless directed by the instructor for in-class activities. Students who do not follow the School's policy in this regard may be required to leave the room for the remainder of the class, so that they do not distract others. Research shows that students' use of laptops in class has negative implications for the learning environment, including reducing their own grades and the grades of those sitting around them.

Citation Style
Please use the American Psychological Association (APA) reference style to cite your sources.

Details of the above policies and other RHL Policies are available at:
http://www.calendar.ubc.ca/vancouver/index.cfm?tree=12,199,506,1625

UNIVERSITY POLICIES AND RESOURCES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the UBC Senate website at https://senate.ubc.ca/policies-resources-support-student-success.

Academic Integrity

The academic enterprise is founded on honesty, civility, and integrity. As members of this enterprise, all students are expected to know, understand, and follow the codes of conduct regarding academic integrity. At the most basic level, this means submitting only original work done by you and acknowledging all sources of information or ideas and attributing them to others as required. This also means you should not cheat, copy, or mislead others about what is your work. Violations of academic integrity (i.e., misconduct) lead to the breakdown of the academic enterprise, and therefore serious consequences arise and harsh sanctions are imposed. For example, incidences of plagiarism or cheating may result in a mark of zero on the assignment or exam and more serious consequences may apply if the matter is referred to the President's Advisory Committee on Student Discipline. Careful records are kept in order to monitor and prevent recurrences.

COPYRIGHT

All materials of this course (course handouts, lecture slides, assessments, course readings, etc.) are the intellectual property of the instructor or licensed to be used in this course by the copyright owner. Redistribution of these materials by any means without permission of the copyright holder(s) constitutes a breach of copyright and may lead to academic discipline. Audio or video recording of classes are not permitted without the prior approval of the Instructor.]

ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəy̓əm (Musqueam) people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

COURSE SCHEDULE
(Subject to change with class consultation)

Class	Topics	Readings	Assessments due
Week 1: Classes 1 and 2 (Jun. 9 & 11)	What is/are Statistics? Key concepts of statistical literacy; data types Describing and displaying univariate categorical and quantitative data Principles of good graphical and tabular displays. Bivariate descriptive statistics.	Ch. 1 Ch. 2 Ch. 3.1-3.5 Ch. 3.6-3.11 Ch. 4	Asst. 1 posted
Week 2: Classes 3 and 4 (Jun. 16 & 18)	Random variables, probability distributions, Normal model, sampling distributions, principles of estimation, confidence intervals, sample size determination	Ch. 5.1, Ch. 6, Ch. 7, Ch. 8, Ch. 9, Ch. 11.1-11.2	Asst. 1 due: Jun. 19 Asst. 2 posted
Week 3: Classes 5 and 6 (Jun. 23 & 25)	Logic of hypothesis testing; one and two-sample hypothesis tests of means and proportions; independent and dependent samples	Ch. 10 Ch. 11 Ch. 12	*Project Part 1*
Week 4: Classes 7 and 8 (Jun. 30 & Jul. 2)	More on two-sample tests Power and sample size; communicating about inference Chi-square tests for count data Framework for statistical modelling	Ch. 12 Ch. 10.9, 10.10 Ch. 13 Ch. 16.1-16.2	Asst. 2 due: Jul. 3 Asst. 3 posted
Week 5: Classes 9 and 10 (Jul. 7 & 9)	Simple linear regression; inference in simple regression; residual analysis and diagnostics Multiple regression model-building The (statistical) world beyond!	Ch. 14 Ch. 15 Ch. 16.3-16.4	Asst. 3 due: Jul. 11 *Project Part 2*
EXAM: Week of Jul. 13-18	Examination (date TBA)		Project Final Report due: Jul. 17