COURSE INFORMATION

Course title:	Application of Statistics in Management		
Course code:	BABS 550	Credits:	1.5
Session, term, period:	2020W1, Period 1	Class location:	On-line
Section(s):	MM1	Class times:	M/W, 6–8 pm (*)
Course duration:	Nov. 2 to Dec. 12, 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 UBC: Nope! (~~604-822-8431~~)	Office location:	My home! (At UBC, HA 475, in case you're interested)
Email:	jonathan.berkowitz@ubc.ca	Office hours:	On-line, TBD

Four optional tutorials, beginning in Week 2: Thursdays Nov. 12, 19, 26, Dec. 3; 4:00 – 6:00 pm
(*) Make-up class on Friday, Nov. 13, in lieu of Nov. 11, Remembrance Day

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

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 6:00 pm on lecture days, 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 will be one small-group project. 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. An e-text version is available. If you buy a new copy from the UBC Bookstore it will come bundled with MyStatLab, an online resource created by the publishers, Pearson Canada.

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

During online lectures, students are not permitted to use any electronic devices other than the primary one used for attending the online lecture (e.g. laptop or desktop). Only Zoom should be open during the online lecture unless an instructor advises the use of another program/website for an in-class activity. Feedback from students indicates that personal devices are the number one distraction from effective learning and participation in the online learning environment.

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.

Respect for Equity, Diversity, and Inclusion

The UBC Sauder School of Business strives to promote an intellectual community that is enhanced by diversity along various dimensions including status as a First Nation, Metis, Inuit, or Indigenous person, race, ethnicity, gender identity, sexual orientation, religion, political beliefs, social class, and/or disability. It is critical that students from diverse backgrounds and perspectives be valued in and well-served by their courses. Furthermore, the diversity that students bring to the classroom should be viewed as a resource, benefit, and source of strength for your learning experience. It is expected that all students and members of our community conduct themselves with empathy and respect for others.

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.

Academic Freedom and Students Studying from Outside Canada

During this pandemic, the shift to online learning has greatly altered teaching and studying at UBC, including changes to health and safety considerations. Keep in mind that some UBC courses might cover topics that are censored or considered illegal by non-Canadian governments. This may include, but is not limited to, human rights, representative government, defamation, obscenity, gender or sexuality, and historical or current geopolitical controversies. If you are a student living abroad, you will be subject to the laws of your local jurisdiction, and your local authorities might limit your access to course material or take punitive action against you. UBC is strongly committed to academic freedom, but has no control over foreign authorities (please visit http://www.calendar.ubc.ca/vancouver/index.cfm?tree=3,33,86,0 for an articulation of the values of the University conveyed in the Senate Statement on Academic Freedom). Thus, we recognize that students will have legitimate reason to exercise caution in studying certain subjects. If you have concerns regarding your personal situation, consider postponing taking a course with manifest risks, until you are back on campus or reach out to your academic advisor to find substitute courses. For further information and support, please visit: http://academic.ubc.ca/support-resources/freedom-expression

COPYRIGHT

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.

ONLINE TEACHING TOOL & REQUIREMENTS

This course will be taught using Zoom for synchronous classes and office hours.

For this course, you are required to use a Zoom account during synchronous classes and office hours. If you do not have a Zoom account, you can create one here: https://zoom.us/signup. Note: creating a Zoom account requires that you provide a first name, last name, and email address to Zoom. For privacy purposes, you may consent to using your existing email address and your real name. Alternatively, if you prefer, you may sign up using an alternative email address and an anonymized name that does not identify you (i.e. Jane Doe, jane.doe@email.com). If you have trouble creating an account, or accessing a Zoom session, please contact CLCHelp@sauder.ubc.ca. You will be required to provide the email address associated with your Zoom account in a Canvas quiz for identification purposes.

To help replicate the classroom experience, make sessions more dynamic and hold each person accountable, both students and instructors are required to have their cameras on during Zoom sessions. Students who require an accommodation with regard to the "camera on" requirement must contact their instructors in advance of the first class to discuss options. As professional graduate students, students are expected to conduct themselves professionally by joining sessions on time, muting mics when not speaking, refraining from using any other technology when in-session, attending in business casual dress (at a minimum), and participating from a quiet environment. Content from synchronous sessions will be selectively recorded per instructor discretion and made available to students on Canvas for a maximum duration of the course length. This is done to allow students the opportunity to return to lecture content to solidify learnings.

COURSE SCHEDULE

(Subject to change with class consultation)

Class	Topics	Readings	Assessments due
Week 1: Classes 1 and 2 (Nov. 2 & 4)	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 (Nov. 9 & 13)	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: Nov. 15 (Sunday) Asst. 2 posted
Week 3: Classes 5 and 6 (Nov. 16 & 18)	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 (Nov. 23 & 25)	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: Nov. 27 (Friday) Asst. 3 posted
Week 5: Classes 9 and 10 (Nov. 30 & Dec. 2)	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: Dec. 4 (Friday) *Project Part 2*
EXAM: Week of Dec. 7-12	Examination (date TBA)		Project Final Report due: Dec. 10