COURSE INFORMATION

Course title:	Descriptive and Predictive Business Analytics		
Course code:	BABS 507	Credits:	1.5
Session, term, period:	2022W1, Period 1	Class location:	HA 254
Section(s):	BA2	Class times:	Tues./Thurs. 4-6pm
Course duration:	Sept. 6, 2022 to Oct. 15, 2022	Pre-requisites:	N/A
Division:	Operations and Logistics	Co-requisites:	N/A
Program:	MBAN		

INSTRUCTOR INFORMATION

Instructor:	Martha Essak, M.Sc.		
Phone:	778-819-8368	Office location:	HA 351
Email:	martha.essak@sauder.ubc.ca	Office hours:	Wed. 12-1pm (online)

COURSE DESCRIPTION

BABS 507 provides students with a theoretical understanding of the basis of regression techniques, as well as practice with the application of linear models. These techniques are widely used in a variety of fields including business, economics, finance and operations research. The skills taught in this course are essential for any business analyst.

In this course, students will learn regression (simple linear regression and multiple linear regression) using continuous variables. In general, these models relate response variables to potential predictor / explanatory variables, and can be used to estimate parameters, make predictions, or statistically control for certain variables. Students will become familiar with when and how to construct different models, how to assess the assumptions and goodness of fit, how to interpret results, and how to present these results in text and graphical form. Students will use the program R for statistical computing for the statistical analysis of real data.

COURSE FORMAT

Class time will consist of lectures, discussions and activities. Students will complete quizzes, readings, homework assignments, and the project outside of class time.

LEARNING OBJECTIVES

By the end of this course, students will be able to:
1. Conduct statistical inference to compare two groups
2. Visualize data and calculate summary statistics
3. Develop linear models that are appropriate to the type of data, and fit them using statistical software
4. Assess if the assumptions of the analysis are met using statistical tests and visualization methods
5. Interpret the parameters of these models and conduct statistical inference on the parameters
6. Perform predictions based on models
7. Assess goodness of fit and compare different models using model diagnostics
8. Use variable selection to assess which variables should be included
9. Present the results of analyses in the form of statistical reports
10. Use the statistical software package R to perform analyses

ASSESSMENTS

Summary

Component	Weight
Assignments	40%
Group project	50%
Quizzes	5%
Class participation	5%
Total	100%

Details of Assessments

Homework Assignments
Students will work **individually** to solve the problems in the homework assignments. Late submissions will not be accepted and will receive a zero. Homework assignments should be handed in electronically via the UBC Canvas system. Assignments will be graded on correctness and clarity.

Project
Students will work **in pairs** on a project (in report form) that uses the techniques learned throughout the course. **You may not work with other classmates outside your partnership or obtain outside help**. Please consult with the instructor if you need help or clarification. The project will be submitted in two parts (Part A: Introduction and exploratory data analysis, Part B: Models, results, and discussion).

Quizzes
Students will work **individually** on the quizzes, which are designed to be completed after you have finished the readings about that material.

Class participation
Class participation will be evaluated via in-class activities using iClicker.

LEARNING MATERIALS
Required Textbooks:
OpenIntro Statistics
Webpage for free download: https://www.openintro.org/book/os/

Regression Analysis: **A Practical Introduction**
By Jeremy Arkes (2019)
Download for free from UBC library

Understanding Regression Analysis: An Introductory Guide
By Larry D. Schroeder, David L. Sjoquist & Paula E. Stephan (2017/2018)
Download for free from UBC library

Estimated cost of required materials: FREE!

Required: iClicker   https://www.iclicker.com/students/
Either iClicker app for iOS or Android, or can get up account through Web portal to use through browser.
Please use your student number if asked as this is essential for tracking participation.
Then add yourself to the course by searching "University of British Columbia" and "BABS 507 BA2".

Technology Requirements

Software:
- o Required: R   https://www.r-project.org
- o Required: RStudio   https://rstudio.com/products/rstudio/download/
- o Required: Anaconda   https://www.anaconda.com/products/individual
- o Recommended: Office 365 (Excel only), which you can download for free as a student:
     https://it.ubc.ca/software-downloads

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. 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.

Code Plagiarism

Code plagiarism falls under the UBC policy for Academic Misconduct. Students must correctly cite any code that has been authored by someone else or by the student themselves for other assignments. Cases of "reuse" may include, but are not limited to:

- • the reproduction (copying and pasting) of code with none or minimal reformatting (e.g., changing the name of the variables)

- • the translation of an algorithm or a script from a language to another

- • the generation of code by automatic code-generations software

An "adequate acknowledgement" requires a detailed identification of the (parts of the) code reused and a full citation of the original source code that has been reused.

Students are responsible for ensuring that any work submitted does not constitute plagiarism. Students who are in any doubt as to what constitutes plagiarism should consult their instructor before handing in any assignments.

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.

COVID-19 Policies for Attendance & Academic Concessions:
If a student feels unwell, they should stay home and send a courtesy email to each impacted instructor and cc their program manager. The student should also submit an Academic Concession Request & Declaration Form.

If a student suspects possible COVID-19 infection, they should use the BC Ministry of Health's self-assessment tool, to help determine whether further assessment or testing for COVID-19 is recommended.

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.

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.

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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	Date	Topic	Readings or Activities	Assessments due
1	Sept. 6, 2022	Data types, descriptive statistics, data visualization	OpenIntro Statistics (OIS): 2.1-2.2, 4.1	
2	Sept. 8, 2022	Sampling distributions, statistical inference for two groups (comparing proportions and comparing means)	OIS: Ch. 5, 6.1-6.2, 7.1, 7.3	**Quiz #1 Due Wed. Sept. 7 at 11:59pm**
3	Sept. 13, 2022	Simple linear regression (SLR): Finding and interpreting co-efficients, assumptions, goodness of fit	OIS: 8.1-8.2, 8.4 Arkes 2.1-2.8 Schroeder et al. Ch. 1	**Quiz #2 Due Mon. Sept. 12 at 11:59pm**
4	Sept. 15, 2022	Statistical inference for SLR: F-tests and t-tests	Arkes Ch. 5 Schroeder et al. Ch. 3	**Assignment 01 Due Wed. Sept. 14 at 11:59pm**
5	Sept. 20, 2022	Transformations for SLR		**Quiz #3 Due Mon. Sept. 19 at 11:59pm**
6	Sept. 22, 2022	Multiple Linear Regression (MLR): finding and interpreting co-efficients, assumptions, goodness of fit, statistical inference	Arkes Ch. 2.9-2.11 Schroeder et al. Ch. 2	**Assignment 02 Due Wed. Sept. 21 at 11:59pm**
7	Sept. 27, 2022	MLR: Transformations and interactions	Arkes 4.1-4.2, 4.5-4.7 Schroeder et al. Ch. 4	**Project Part A Due Mon. Sept. 26 at 11:59pm**
8	Sept. 29, 2022	Scaling and prediction	Arkes Ch. 7	**Assignment 03 Due Wed. Sept. 28 at 11:59pm**
9	Oct. 4, 2022	Variable selection		
10	Oct. 6, 2022	Unusual observations and Collinearity	OpenIntro Statistics: 8.3	**Assignment 04 Due Wed. Oct. 5 at 11:59pm**
--	Exam week			**Project Part B Due Fri. Oct. 14, 2022**