COURSE INFORMATION

Course title:	Advanced Predictive Business Analytics		
Course code:	BABS 508	Credits:	1.5
Session, term, period:	2019W2 Period 3	Class location:	HA 337
Section(s):	BA1	Class times:	Mon. and Wed. 2pm-4pm
Course duration:	Jan. 6 to Feb. 15, 2020	Pre-requisites:	BABS 507
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:	Mon. and Wed. 12:45-1:45pm

COURSE DESCRIPTION

BABS 508 provides students with a theoretical understanding of the basis of regression techniques, as well as practice with the application of generalized 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 multiple linear regression, logistic regression and Poisson regression, extending these models to include categorical 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. In this course, students will also learn principal component analysis (PCA), which can reduce the number of variables and account for a high amount of variability. 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. Visualize data and calculate summary statistics
2. Develop linear models that are appropriate to the type of data, and fit them using the statistical software R
3. Assess if the assumptions of the analysis are met using statistical tests and visualization methods
4. Conduct statistical inference on these parameter estimates using hypothesis testing and confidence intervals; interpret the parameter estimates
5. Perform predictions based on models
6. Assess goodness of fit and compare different models using model diagnostics
7. Use variable selection to assess which variables should be included
8. Present the results of analyses in the form of a report

ASSESSMENTS

Summary

Component	Weight
Assignments	40%
Project	40%
Quizzes	5%
Professionalism, participation	15%
Total	100%

Details of Assessments

Homework Assignments

Students will **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 **individually** on a project (in report form) that uses the techniques learned throughout the course. **You may not work with classmates or obtain outside help**. Please consult with the instructor if you need help or clarification.

Quizzes

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

Professionalism, participation

Professionalism will be assessed based on punctuality, preparation for class, participation in class activities, contribution to class discussions, and interaction with peers and the instructor.

LEARNING MATERIALS

Required books:
You can access the following books for free at library.ubc.ca

Understanding Regression Analysis: An Introductory Guide
By Larry D. Schroeder, David L. Sjoquist & Paula E. Stephan (2018)

Generalized Linear Models with Examples in R
by Peter Dunn & Gordon Smyth. (Springer, 2018)

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.

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.

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.

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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)

Class	Date	Topic	Readings or Activities	Assessments due
1	Jan. 6	Multiple Linear regression with categorical variables	Ch 4-5 (Schroeder et al.)	Quiz #1 due Monday Jan. 6 at 2pm
2	Jan. 8	Multiple Linear regression with categorical variables		
3	Jan. 13	Intro to GLMs and Logistic Regression	Ch. 4, 5, 7, 9 (Dunn and Smyth)	Quiz #2 due Monday Jan. 15 at 2pm
4	Jan. 15	Logistic Regression		**Assignment #1 due Tuesday Jan 14 at 11pm**
5	Jan. 20	Logistic Regression with multiple explanatory variables	Ch. 7-9 (Dunn and Smyth)	**Assignment #2 due Tuesday Jan 21 at 11pm**
6	Jan. 22	Logistic Regression with multiple explanatory variables		
7	Jan. 27	Poisson Regression	Ch. 10 (Dunn and Smyth)	Quiz #3 due Monday Jan. 27 at 2pm
8	Jan. 29	Poisson Regression		**Assignment #3 due Tuesday Jan 28 at 11pm**
9	Feb. 3	Principal Component Analysis	Online Readings* (see URL below)	Quiz #4 due Monday Feb. 3 at 2pm
10	Feb. 5	Principal Component Analysis		**Assignment #4 due Tuesday Feb 4 at 11pm**
	Feb. 10-14			**Final project deadline TBA**

Lesson 11: https://newonlinecourses.science.psu.edu/stat505/lesson/11