

### COURSE INFORMATION

Course title:	Descriptive and Predictive Business Analytics		
Course code:	BABS 507	Credits:	1.5
Session, term, period:	2019W2 Period 2	Class location:	HA 337
Section(s):	BA1	Class times:	Mon. and Wed. 10am-12pm
Course duration:	Nov. 4 to Dec. 14, 2019	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:	Mon. and Wed. 12-1pm

### 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. Visualize data and calculate summary statistics
2. Develop linear models that are appropriate to the type of data, and fit them using statistical software
3. Assess if the assumptions of the analysis are met using statistical tests and visualization methods
4. Interpret the parameters of these models
5. Conduct statistical inference on these parameters using point estimation and confidence interval estimation
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

<u>Component</u>	<u>Weight</u>
Assignments	40%
Project	40%
Quizzes	5%
Professionalism	15%
Total	<u>100%</u>

### 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

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](http://library.ubc.ca)

#### Regression Analysis: A Practical Introduction

By Jeremy Arkes (2019)

#### Understanding Regression Analysis: An Introductory Guide

By Larry D. Schroeder, David L. Sjoquist & Paula E. Stephan (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.

### 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 xwm̓əθkwəy̓əm (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	Nov. 4	Hypothesis testing and confidence intervals for means		
2	Nov. 6	Simple Linear Regression (SLR)	Arkes 2.1-2.8 Schroeder et al. Ch. 1	<b>Quiz #1 due Nov. 6 at 10am</b>
3	Nov. 13	SLR: Hypothesis testing	Arkes Ch. 5 Schroeder et al. Ch. 3	
4	Nov. 15	SLR: Transformations		<b>Assignment #1 due Fri. Nov. 15 at 11pm</b>
5	Nov. 18	Multiple Linear Regression (MLR)	Arkes Ch. 2.9-2.11 Schroeder et al. Ch. 2	<b>Quiz #2 due Nov. 18 at 10am</b>
6	Nov. 20	MLR	Arkes 4.1-4.2, 4.5-4.7	<b>Project Part A due Thurs. Nov. 21 at 11pm</b>
7	Nov. 25	Diagnostics for unusual observations		<b>Assignment #2 due Mon. Nov. 25 at 11pm</b>
8	Nov. 27	MLR: Transformations and interactions	Schroeder et al. Ch. 4 Transformations	
9	Dec. 2	Multicollinearity and variable selection	Arkes Ch. 6 Schroeder et al. Ch. 5	<b>Assignment #3 due Mon. Dec. 2 at 11pm</b>
10	Dec. 4	Best practices in data visualization		<b>Quiz #3 due Dec. 4 at 10am</b>
11	Dec. 9-14	Exam Week		<b>Project Part B due.</b> Will be scheduled by RHL Office.

*Note: Due to Remembrance Day on Nov. 11, 2019, the university is closed. A make-up class will be held on Friday Nov. 15 10am-12pm in HA 337.*