

COURSE INFORMATION

Course title:	Descriptive and Predictive Business Analytics		
Course code:	BABS 507	Credits:	1.5
Session, term, period:	2021W1, Period 1	Class location:	HA 133
Section(s):	BA1	Class times:	Tuesdays, Thursdays 2:00pm – 4:00pm
Course duration:	September 7, 2021 to October 9, 2021	Pre-requisites:	N/A
Division:	Operations and Logistics	Co-requisites:	N/A
Program:	MBAN		

INSTRUCTOR INFORMATION

Instructor:	Wendy Kei, Ph.D., CFA	Office location:	HA 351
Email:	wendy.kei@ubc.ca	Office hours:	By appointment

COURSE DESCRIPTION

BABS 507 will focus on two business analytic concepts.

- **Descriptive data analysis:** Students will learn data cleansing techniques; data visualization techniques; measures of location, variability, and association; types of datasets; and importance of using data codebooks.
- **Predictive data analysis:** Students will learn linear regression techniques for cross-sectional datasets, which include model assumption assessments; introduction to concepts of causality and predictions; model misspecifications; goodness of fits; interpretation of results; and presentation of model results.

Students will use the program R (or RStudio) for statistical computing to apply these two business analytic concepts on real data.

COURSE FORMAT

This course will primarily be in-person (unless stated otherwise due to Covid-19 restrictions). It will involve a combination of synchronous and asynchronous activities. Synchronous activities include: in-person lectures plus in-class participation (2 hours per class). Asynchronous activities include: two online assignments, group project, and required readings and videos (to be reviewed before in-class lectures). Course syllabus are available on the course Canvas website.

Students should be polite and respectful when they interact in class as well as when using the Discussion Forum/Announcement platforms in Canvas.

LEARNING OBJECTIVES

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

- work effectively in teams to process, summarize, analyze, interpret data to make informed decisions;
- present data findings using tabular and graphical techniques;
- apply linear regression techniques for estimating relationships and making predictions;
- use statistical software package R to perform descriptive and predictive data analyses; and
- retrieve reliable public use microdata files and codebooks from data repository holdings.

ASSESSMENTS

**** THERE WILL BE NO FINAL EXAM IN THIS COURSE ****

Summary

<u>Component</u>	<u>Weight</u>
Assignments	20%
Group project (3 deliverables)	65%
Class participation	<u>15%</u>
Total	<u>100%</u>

Details of Assessments

Two (2) Online Assignments: 20%

Students should complete the assignments on Canvas (online) individually, i.e. no group collaboration. Students will need to e-sign an integrity pledge before they start each assignment. Each online assignment includes up to 30 multiple-choice, true/false, and fill-in-the-blank questions. The questions will appear sequentially, one at a time. Students will be given 1 attempt to complete the assignment. A practice “assignment” will be posted on Canvas the first week of class so that students can use it to troubleshoot for any technical problems and to see a preview of the assignment format. The practice “assignment” does not count for marks and contains up to 4 questions as a preview. See below for the available start date and deadline date of each assignment.

- **Assignment 1 (Descriptive analytics, Topics 1 and 2): 10% weight**
 - Available for access on Thursday September 23, 2021
 - Due at 11:59pm PT on Sunday September 26, 2021
- **Assignment 2 (Simple Linear Regression, Topic 3): 10% weight**
 - Available for access on Thursday October 7, 2021
 - Due at 11:59pm PT on Sunday October 10, 2021

These deadlines are binding and no assignments will be accepted after the deadline. Failure to submit the online assignment individually will receive a grade of 0. This is non-negotiable.

Group Project: 65%

Students will be randomly assigned by Canvas into a group of 4-5 students to present an interesting empirical finding from the Statistics Canada’s *General Social Survey Time Use* dataset. There are 3 deliverables for this project.

- **Deliverable #1: Proposal (10% weight), due Tuesday September 21, 2021 at 11:59pm PT**
Student teams will select a topic to explore based on the variables retrieved from the Statistics Canada's *General Social Survey Time Use* dataset. Student teams will need to upload to TurnItIn the proposed topic, a table listing the variables of interest, and a table outlining how tasks will be allocated across team members. Student will apply data analytic techniques from Topic 1 in this exercise.
- **Deliverable #2: Data visualization (25% weight), due Sunday October 3, 2021 at 11:59pm PT**
Student teams will use data visualization techniques (from Topic 2) to illustrate univariate and/or bi-variate relationships for their topic from Deliverable #1, using variables derived from the Statistics Canada's *General Social Survey Time Use* dataset. Student teams will need to upload to TurnItIn a preliminary report for this part of the analysis.
- **Deliverable #3: Linear regression model constructions (30% weight), due date TBD**
Student teams will apply the findings from deliverable #2 to help build linear regression model(s) (using techniques from Topics 3 and 4), in order to explore potential relationships between an outcome variable of interest and various explanatory variables. Student teams will need to upload to TurnItIn a finalized report summarizing their research findings.

All team members are expected to receive the same grade for the project. However, if there is sufficient evidence to demonstrate that a particular team member fails to contribute in the group project, the course instructor reserves the right to deduct up to 50% of the project score from this student's grade. If possible, student groups should find ways to resolve internal team conflicts should they arise and make sure that all task allocations are equally distributed across team members. Please consult with the course instructor if you need help or clarifications.

IMPORTANT REMARK: If there are any signs of academic dishonesty in the group project, including but not limited to receiving a score of over 70% in the TurnItIn's Similarity Report, the Course Instructor reserves the right to give 0 points for group project component (or to the entire group project, depending on the severity of the incident). All team members will receive 0 grade in this case.

These deadlines are binding and no project components will be accepted after the deadline. Failure to submit the project components individually on Canvas will receive a grade of 0. This is non-negotiable.

Class Participation: 15%

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. iClicker Cloud will be used for this part of the assessment.

LEARNING MATERIALS

Required statistical software:

R or RStudio will need to be used for online assignments and group project.

- R or R Studio – any version can be used for this course
Students can download R for free at the following website: <https://cran.r-project.org/>

Students can download RStudio Desktop for free at the following website:
<https://rstudio.com/products/rstudio/download/>

Students can visit the following websites for more information about R:
<https://stats.idre.ucla.edu/r/>
<https://www.econometrics-with-r.org/>

Required course website and learning technology:

- Canvas
- TurnItIn (see below)
- iClicker Cloud (see below)

Use of TurnItIn for Group Project Assessments:

To submit your group project on www.turnitin.com, you will need to create a unique user profile, consisting of a username (email address) and password.

Important Privacy Information: Information submitted to Turnitin is stored in the United States. Remove identifying information, such as your name and student number, from the text of any assignment submitted to Turnitin. In order to protect your privacy, please follow these instructions.

1. Create an anonymous email address using one of the available free services.
2. Go to www.turnitin.com.
3. At the top right, go to Create Account and select Student.
4. Enter the Class ID and Enrolment Password given to you by your instructor.
5. Create an alias or pseudonym. Please remember to let your instructor know your alias.

You can submit a paper in two ways:

- File Upload - Turnitin currently accepts submissions in Microsoft Word, WordPerfect, RTF, PDF, PostScript, plain text, and HTML formats.
- Cut and Paste - You can cut and paste the text of your submission into a text box.

Removing Identifying Information: Please delete any identifying information from the original document prior to uploading it. This includes your name and student number in the document, as well as any metadata or hidden data that might be stored in the document itself.

To remove metadata from your Microsoft Word document:

- Windows: You can remove the hidden data by using Microsoft Word's Document Inspector.
- Mac: You can remove the hidden data by clicking on Word > Preferences > Security, then selecting Remove personal information from this file on save."

More on this here: <https://lthub.ubc.ca/guides/turnitin/>

Use of iClicker Cloud for Class Participation Assessments:

iClicker Cloud will be used for taking attendance and for students to answer conceptual questions in class. See hyperlink below for instructions on setting up iClicker Cloud for Students:

<https://lthub.ubc.ca/guides/iclicker-cloud-student-guide/>

Recommended (but not required) textbook (available for purchase from the UBC Bookstore):

Camm, J.D., Cochran, J. J., Fry, M. J., & Ohlmann, J. W. (2021). *Business Analytics* (4th ed.). Cengage Learning Inc.

Wooldridge, J. (2019). *Introductory Econometrics: A Modern Approach* (2nd ed.). South-Western College Publication.

These textbooks are recommended as supplementary resources to this course, and are available for purchase at the UBC Bookstore. Please refer to <https://shop.bookstore.ubc.ca/booklist.aspx> for an estimate of the cost. You are welcome to use other edition of the recommended textbook.

Recommended (but not required) textbook (free, available through the UBC Library):

Bruce, P., Bruce, A., Gedeck, P. (2020). *Practical Statistics for Data Scientists, 2nd Edition*. O'Reilly for Higher Education.

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.

THE COURSE INSTRUCTOR WILL REWEIGH THE ASSIGNMENTS AND PROJECT COMPONENTS ONLY IF THE FACULTY ADVISING OFFICE APPROVES THE ACADEMIC CONCESSION REQUEST. FOR EXAMPLE, IF THE FIRST ASSIGNMENT WAS EXCUSED DUE TO AN ACADEMIC CONCESSION, THE SECOND ASSIGNMENT WILL BE WORTH 20%.

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) <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, or the generation of code by automatic code-generation 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.

If a student is required to self-isolate (e.g., while waiting for test results), they should follow the steps above (stay home, email instructor(s) and program manager, submit an [Academic Concession Request & Declaration Form](#), and follow BC Health Guidance.

Students who are required to quarantine, should get in touch with their Program Manager to discuss the possibility of academic concessions for each impacted course. The Program Manager will work closely with your instructors to explore options for you to make up the missed learning.

COVID-19 Safety in the Classroom:

Masks: Masks are **required** for all indoor classes, as per the BC Public Health Officer orders. For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. For the purposes of this order, the term “masks” refers to medical and non-medical masks that cover our noses and mouths. Masks are a primary tool to make it harder for Covid-19 to find a new host. You will need to wear a medical or non-medical mask for the duration of our class meetings, for your own protection, and the safety and comfort of everyone else in the class. You may be asked to remove your mask briefly for an ID check for an exam, but otherwise, your mask should cover your nose and mouth. Please do not eat in class. If you need to drink water/coffee/tea/etc, please keep your mask on between sips. Students who need special accommodation are asked to discuss this with the program office.

Seating in class: To reduce the risk of Covid transmission, please sit in a consistent area of the classroom each day. This will minimize your contacts and will still allow for the pedagogical methods planned for this class to help your learning.

Visit the following website for the most recent updates regarding Covid-19 protocol on campus: <https://students.ubc.ca/campus-life/returning-to-campus>

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

In-Person Regulations

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.

On-Line Lecture Regulations

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>

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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 and could be subject to legal action. Any lecture recordings are for the sole use of the instructor and students enrolled in the class. In no case may the lecture recording or part of the recording be used by students for any other purpose, either personal or commercial. Further, audio or video recording of classes are not permitted without the prior consent of the instructor. Students may not share class Zoom links or invite others who are not registered to view sessions.

ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the x^wməθk^wəy̓əm (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 might be taught using Zoom for synchronous classes and office hours.

For this course, you might be 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	Synchronous Or Asynchronous	Date	Topic	Readings or Activities	Assessments due
1	Synchronous	Sep 7	Course overview and Introduction to Data Analytics: Understanding types of datasets and random sampling	Topic 1 notes on Canvas	
2	Synchronous	Sep 9	Introduction to Data Analytics: Data cleansing	Topic 1 notes on Canvas	
3	Synchronous	Sep 14	Data Visualization and Descriptive Statistics: Visualize qualitative (categorical) variables	Topic 2 notes on Canvas	
4	Synchronous	Sep 16	Data Visualization and Descriptive Statistics: Visualize quantitative (continuous) variables	Topic 2 notes on Canvas	
5	Synchronous	Sep 21	Simple Linear Regression: Interpretation of coefficient results, model assumptions, and measures of variation	Topic 3 notes on Canvas	Project: Deliverable #1 due Tuesday September 21, 2021 at 11:59pm PT

6	Synchronous	Sep 23	Simple Linear Regression: Sampling variance and statistical inference	Topic 3 notes on Canvas	Assignment #1 due Sunday September 26, 2021 at 11:59pm PT
7	Synchronous	Sep 28	Simple Linear Regression: Predictions and Transformations	Topic 3 notes on Canvas	
8	Synchronous	Sep 30	Multiple Linear Regression: Model assumptions, interpretation of coefficient results, use of dummy variables, quadratic variables, and interaction terms	Topic 4 notes on Canvas	Project: Deliverable #2 due October 3, 2021 at 11:59pm PT
9	Synchronous	Oct 5	Multiple Linear Regression: Measures of variation, adjusted R-squared, sampling variances, and model misspecifications	Topic 4 notes on Canvas	
10	Synchronous	Oct 7	Multiple Linear Regression: Predictions and out of sample	Topic 4 notes on Canvas	Assignment #2 due Sunday October 10, 2021 at 11:59pm PT
					Project Deliverable #3 Due date TBD by RHL Office