

### COURSE INFORMATION

Course title:	Experiments and Causal Inference
Course code:	BAMA 580A
Session, term, period:	2022W2, Period 3
Credits:	1.5
Class location:	HA 133
Sections:	BA1 & BA2
Course duration:	Feb 21 to 25, 2023
Class times:	<u>Both sections:</u> 9AM-11AM <u>BA1:</u> 1PM-3PM on Feb.21, 23, 25 3:30PM-5:30PM on Feb. 22, 24 <u>BA2:</u> 1PM-3PM on Feb.22, 24 3:30PM-5:30PM on Feb.21, 23, 25
Division:	Marketing
Program:	MBAN

### INSTRUCTOR INFORMATION

Instructor:	Yann Cornil
Email:	yann.cornil@sauder.ubc.ca
Office location:	HA573
Office hours:	By appointment

### COURSE DESCRIPTION

Today, managers have access to an avalanche of data that should help them understand the drivers of success—whether it is sales, consumer choice, consumer satisfaction, or employee satisfaction. The reality is that it is particularly challenging to infer causality from past data, and thus to understand what managerial decisions will causally increase the chance of success. There is, however, one research method that is particularly calibrated for establishing causality: experiments.

This is a course on the fundamentals of the experimental method applicable to marketing, but also organization behaviour, psychology, and behavioral economics. It will focus on both theoretical and practical considerations, and help students acquire the methods to design, conduct, analyze, and report experiments in a business context.

Importantly, this is not a quantitative course: although there will be some basic statistics, the purpose of this course is to help students understand the importance of experimentation for business research, to provide clear guidance for field experiments via case studies, and to use software (Qualtrics for survey design, R for statistical analysis) that will help students conduct and analyze experiments in a creative yet rigorous manner.

### COURSE FORMAT

In terms of learning method, this course will provide a blend of lectures, case studies, hands-on exercises, and methodological discussions. Students are highly encouraged to actively participate in class discussions. Note that this course is taught in an intensive week-long format.

You can expect to spend 4 hours per day in class, 2-3 hours per day on reading and preparation questions, and about 4-5 hours over the full week on the group project (in addition to time spent in class on the project).

### LEARNING OBJECTIVES

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

- understand the scientific rationale of experimentation and the concept of validity for causal inference
- place experiments, and in particular field experiments, in the larger context of business research
- choose appropriate experimental designs for business research
- be able to critically assess an experiment (validity, power, effect size, integrity)
- create a survey-based experiment
- conduct statistical analyses, report the results, create visualizations, and draw insights from the results of an experiment

### ASSESSMENTS

#### Summary

<u>Component</u>	<u>Weight</u>
Case Studies preparation questions	25%
In-class exercises	20%
In-class short quizzes	5%
Final Group Project	40%
Class participation/Commitment	<u>10%</u>
Total	<u>100%</u>

#### Case Studies Preparation Questions

We will treat three case studies in class: BEworks (an introduction to business experiments), Rocket Fuel (on experiments in online advertising) and Kjell & Company (on field experiments in organization/employee motivation). You will need to answer preparation questions for each of these cases: please only answer the questions indicated on Canvas (under assignments), and not all the questions indicated in the case documents. The cases are self-contained, so you don't need to look for external information.

#### In-class Exercises

Some of the in-class exercises will need to be completed individually. For some other exercises, you will have the possibility (not the obligation) to work with one other classmate. Please download R, RStudio, and GPower (see under Software) before class in order to be ready for the exercises.

#### In-class short quizzes

There will be in-class, short quizzes based on the lectures and the assigned readings.

#### Final Group Project

Your goal is to create an experiment, and present your study and the results during the final class. Your project can be related to any topic (e.g., marketing, organization behaviour, behavioural economics, psychology, political behaviour, health, etc.). For instance, you can create a conceptual replication of a "framing effect" experiment that we have seen in class or that you have found in the academic

literature, although you need to create original stimuli and questions, and study the effect in an original context (i.e., a different context than the experiment you attempted to replicate). You could also do a more practical, marketing-oriented experiment, by comparing the effectiveness of two ads. Your experiment should include two experimental conditions (for instance, two marketing messages, or two organizational messages) and one measured moderator (for instance, a variable measuring demographic or psychological traits). You will implement your study on Qualtrics, analyze the data with R, and create data visualizations with the software of your choice (R, Tableau, Excel). Since we don't have much time, I will take care of recruiting participants for your study.

You will be evaluated based on a 13 to 15-minute presentation and on your PowerPoint slide deck to be submitted on Canvas. Your presentation should cover your experimental design, results and data visualizations, and your conclusion/managerial recommendations. Your slide deck should also contain a detailed appendix with all necessary details about your project, such as research materials, and additional statistics. You don't need to write a full paper.

Peer evaluations will be completed at the end of the term to provide feedback on how team members think each member is contributing to the team's group project. Individual grades on the group project may be subject to adjustment following my review of peer evaluations. Reductions can be significant, ranging from a decrease of 10% to a decrease of 100% if an individual has contributed little or nothing to the team's work. In most instances, where team members are reliable and contribute, no adjustments are made.

As this project involves research with human participants, you must conduct your project in an ethical manner. You may not use any deception in your project, nor anything offensive or threatening. Furthermore, you should not collect identifying information (such as names or addresses). You must also have completed your ethics training at <http://tcps2core.ca/welcome>. If you have any questions about ethics, ask me for guidance. More information will be provided in class and on Canvas.

### *Class Participation/Commitment*

We all bring experience and knowledge into the classroom, and I expect all class participants to share this and benefit from it. For effective class participation you need to have read the assigned materials. Effective class participation includes:

1. asking questions about concepts from lectures or readings that you agree or disagree with;
2. sharing your experience or point of view with the class
3. building on points raised by others;
4. clarifying issues or
5. relating topics discussed to previous class discussions.

Direct student-student interaction is encouraged. Such interaction should be both positive and courteous even when your opinions differ. Class attendance is important. Regular and punctual attendance is a necessary but not a sufficient criterion for high class participation grades.

Rather than merely repeating concepts from the assigned readings, class sessions will be devoted to extending and applying concepts. I will assume that all of you have completed the reading prior to class so that we can spend time on class exercises. Be prepared to discuss and present the assigned readings and/or problems. Your learning will be substantially enhanced if you come to class well prepared.

## LEARNING MATERIALS

### *Online Readings*

Some of the course readings will be available free of charge on Canvas. The rest of the readings will need to be purchased as explained below.

### *Course Reader*

Please purchase the course reader via: <https://www.iveypublishing.ca/s/ivey-coursepack/a1R5c00000EliqREAT>

### *Software*

We will use the following software:

- Qualtrics for survey design (<https://www.qualtrics.com/>). Please create an account by following the instructions in the document "Group Project Guidelines" available on Canvas.
- R and RStudio Desktop (to download on <https://cran.r-project.org/> and <https://posit.co/downloads> )
- GPower (to download on <https://stats.idre.ucla.edu/other/gpower/> )

## COURSE-SPECIFIC POLICIES AND RESOURCES

### *Missed or late assignments*

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) <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*

Laptops and other electronic devices (cellphones, tablets, personal technology, etc.) are not permitted in class unless required by the instructor for specific in-class activities or exercises. Cellphones and other personal electronic devices must be turned off during class and placed away from the desktop. Students who fail to abide by the RHL “lids down” policy will be asked to leave the room for the remainder of the class. 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**

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. If there are online lectures, 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<sup>w</sup>məθk<sup>w</sup>əyəm (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)

	Date	Topic(s)	Readings (available on Canvas, unless indicated "Course Reader")	Assessments due
1	Feb 21 9-11AM <i>Both sections</i>	<b>The experimental method: Introduction &amp; Business relevance</b>	<ul style="list-style-type: none"> <li>Causation and Experimental Design. <i>Chambliss &amp; Schutt Chapter 6</i></li> <li>BEworks: Experimentation in Business. <i>Ivey Case</i> COURSE READER</li> </ul>	BEworks Case preparation questions, due at 9AM
2	Feb 21 <u>BA1</u> : 1-3PM <u>BA2</u> : 3:30-5:30PM	<b>Experimental research on frames and nudges</b>  <u>Group Project Activity</u> : Experimental design and hypotheses.	<ul style="list-style-type: none"> <li>Group Project Guidelines.</li> <li>Experiments on Framing Effects.</li> <li><b>Optional</b>: Explore <a href="https://tinyurl.com/100nudges">https://tinyurl.com/100nudges</a></li> </ul>	
3	Feb 22 9-11AM <i>Both sections</i>	<b>Experiments in digital marketing</b>	<ul style="list-style-type: none"> <li>The Surprising Power of Online Experiments. <i>HBR</i></li> <li>Rocket Fuel: Measuring the Effectiveness of Online Advertising. <i>Berkeley Case</i></li> </ul>	Rocket Fuel Case preparation questions, due at 9AM
4	Feb 22 <u>BA2</u> : 1-3PM <u>BA1</u> : 3:30-5:30PM	<b>Survey-based experiments &amp; Qualtrics Tutorial</b>  <u>Group Project Activity</u> : Creating your experiment on Qualtrics (please create an account before class).	<ul style="list-style-type: none"> <li>Self-reports &amp; Surveys</li> <li><b>Optional</b>: Explore Qualtrics online tutorials on Qualtrics.com &gt; Support &gt; Survey Projects</li> <li><b>Optional</b>: How questions shape the answers</li> </ul>	Group Project: Share your Qualtrics Survey with me by 5PM (section BA2) or by 7:30PM (section BA1)
5	Feb 23 9-11AM <i>Both sections</i>	<b>Effect size, power, and false positives &amp; negatives</b>	<ul style="list-style-type: none"> <li>Why Optimizely got me fired</li> <li>A Practical Primer To Power Analysis for Simple Experimental Designs. <i>IRSP</i> (p.1-10, the rest is optional)</li> </ul>	
6	Feb 23 <u>BA1</u> : 1-3PM <u>BA2</u> : 3:30-5:30PM	<b>Analysis, reporting, and data visualization</b>  <u>Group Project Activity</u> : Analyzing experimental data	<ul style="list-style-type: none"> <li>R Cheat Sheet</li> </ul>	
7	Feb 24 9-11AM <i>Both sections</i>	<b>Field Experiments &amp; Natural Experiments I</b>	<ul style="list-style-type: none"> <li>Kjell &amp; Company. <i>Harvard Case</i> COURSE READER</li> <li>Conducting Research in Marketing with Quasi-Experiments. <i>JMR</i></li> </ul>	Kjell & Company Case preparation questions, due at 9AM

8	Feb 24 <u>BA2</u> : 1-3PM <u>BA1</u> : 3:30-5:30PM	<u>Group Project Activity</u> : Finalizing your group project		
9	Feb 25 9-11AM <i>Both sections</i>	<b>Field Experiments &amp; Natural Experiments II</b>  Guest speaker: Baek Jung Kim	<ul style="list-style-type: none"> <li>• <b>Optional reading:</b> Field Experiments in Ride-Sharing. <i>ManSci</i></li> </ul>	
10	Feb 25 <u>BA1</u> : 1-3PM <u>BA2</u> : 3:30-5:30PM	<u>Group Project Activity</u> : Presentation of your group project		Group Project: Upload your slides by 1PM (BA1) or 3:30PM (BA2)