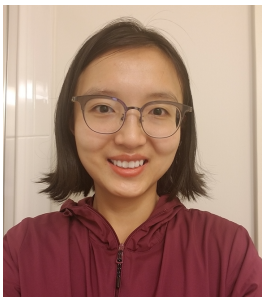
PSYC 359 001
Advanced Research Methods in Behavioural Sciences

Lecture: *Tue & Thu, 2pm-3:30pm in Chemistry D200*
Lab: *Tue 3:30pm-5pm in EOSM 135*

Instructor



Cathy (Xijuan) Zhang
Office location: Kenny 2029
Office hours: Thursday, 3:40pm-4:40pm
Email: cathyxijuan@gmail.com

Cathy in ≤ 25 words: Came to Canada at the age of 13; All degrees obtained at UBC; Eat 1.5 meal per day; Play piano

In This Syllabus

Teaching Assistant (TA)

Name: Sam Phuong
Office location: Kenny 1906
Office hours: Friday,11:30am -12:30am
Email: phuong.can@ubc.ca

Sam in ≤ 25 words: I came to Vancouver one year ago and discovered that I love hiking, biking and our local Asian food scene.

Course Description

Pre-requisite course: PSYC 218 or equivalent.

Learning Goals:

- Understand the mathematical foundations behind statistics.
- Know the difference between parametric and nonparametric statistics.
- Know how to use common statistical methods used in psychological research (i.e., ANOVA and regression).
- Introduce modern/advanced statistical methods (i.e., bootstrap, machine learning, Bayesian statistics).

Withdrawals: Withdrawal from this course without record of the course on your transcript must occur before September 17, 2019, or before October 11, 2019 for withdrawal with a standing of “W” on your transcript.

Course Materials

Required Readings:
Textbook written by Dr. Bruce Dunham from the Department of Statistics. It will be posted on Canvas. The required readings are very important for performing well in this course.

Textbook for learning R:
R for Dummies by Andrie de Vries and Joris Meys; 2nd edition.
Amazon: https://www.amazon.ca/R-Dummies-Andrie-Vries/dp/1119055806/

iClicker:
Available at the UBC bookstore. This is required for your iClicker participation and performance grades.

Course Websites:
Lecture slides, assignments, and grades will be available through Canvas. Lecture slides will be posted after class. Piazza will be used for discussion. We encourage you to post any questions about the course on Piazza so other students can share the information. Our TA and I will check the piazza daily.

Lecture Structure:

To promote active learning, this course will be taught through a combination of lectures and in-class activities. For the in-class activities, you will be assigned in a group of two or three students for discussion.

Learning Appraisals at a Glance

Learning Appraisal Activity	Date	Percent of Total Grade
Midterm 1	October 3	25%
Midterm 2	November 5	25%
Written Assignment 1	September 24	8%
Written Assignment 2	October 24	8%
Written Assignment 3	November 21	8%
Project	November 26	10%
Lab	Throughout	10%
iClicker Participation	Throughout	3%
iClicker Performance	Throughout	3%
Total		**100%**
Bonus: LaTex or RMarkdown		**Up to 2%**

Learning Appraisal Descriptions

Midterm Exams
The midterm exams will consist of multiple-choice questions, and written questions. These will draw on both lectures and the readings, and, for superior performance, you must have a clear understanding of both these sources of course content. The exams will be cumulative. You will not be required to write R code on the exam but you need to be able to read R code. For each exam, you will be allowed to bring a handwritten formula sheet on a letter size paper. Exams will be cumulative.

iClicker Participation
Active participation during lectures will be essential for you to learn the material, prepare for exams, and get the most out of this course. Please bring your clicker to every class; it is not possible to make up iClicker points if you are absent or if you forget your clicker.
Please be sure to register your i>clicker ID by clicking on "i>clicker Student Registration" on the sidebar of the course Canvas page. For each lecture, you will receive 1 participation point if you respond to at least 50% of all the iClicker questions (including Bonus iClicker questions) presented in the lecture. There will be a total of 20 lectures with iClicker questions; so there will be a total of 20 points you can earn for iClicker participation. Your final grade for iClicker participation will be based on the proportion of points you have earned out of the 20 points.

iClicker Performance
For each iClicker question you **have answered correctly**, you can earn 1 point for iClicker performance. There will be some Bonus iClicker questions in some lectures. The Bonus questions can be used to compensate for the points you lost for questions you have not answered correctly. Your final grade for iClicker participation will be based on the proportion of points you have earned out of the total number of non-Bonus iClicker questions presented throughout the course.

Labs
You will be mainly learning how to use the computer software *R* to analyze data in your lab. You must bring your own laptop to the lab because you will be analyzing data using *R* during the lab. Each lab involves the completion of an in-lab activity worksheet. You will work with a partner to complete the worksheet, you and your partner need to hand in the worksheet at the end of each lab for marks. We will post readings on how to use *R* before the lab. If you are not familiar with *R*, doing the readings is essential for doing well in the lab.

Written Assignment
There will be three written assignments for this course. Each assignment will contain calculation and written questions. You may discuss the questions with your classmates but you need to write your own R code and written answers for the assignments. Please show work for calculation questions and attach any R code you write for each assignment. I may also have one or two bonus questions on each assignment. The bonus marks can be used to compensate marks lost on the assignments or exams.

Project
You will work with two or three other students to analyze a dataset using multiple regression. The dataset should contain one dependent variable and at least two independent/independent variables. The dependent variable should be a continuous variable, but the independent variables can be categorial or continuous. You will write a report and do an in-class presentation for this project. Detailed instructions and marking rubrics will be provided later in the course.

Bonus Grades
You can earn bonus grade if you use LaTex or RMarkdown to write your written assignment. For each written assignment completed with LaTex and RMarkdown, you can earn 0.67% course grade (i.e., 2% for all three assignments). Please attach your raw LaTex or RMarkdown code if you want the bonus grade. I will not cover LaTex nor RMarkdown in class but I will provide some resources for you to learn.

Course Policies

Attendance
I expect you to attend every lecture. While we will be posting lecture slides **after** class, these are NOT a substitute for lecture, and exams will contain a significant amount of content only provided in lecture. I will number our lecture slides so that you can take notes corresponding to each slide during lecture. If you must miss a class, please contact your fellow classmates to obtain notes and/or information on what you missed.

In the Classroom
Your behaviour in the classroom reflects on you as a person and student. Treat your instructors, fellow classmates, and anyone else that might be a part of our class with respect. This means being courteous and respectful when asking questions or making comments during class, and not monopolizing a discussion or question period.

During Exams
Every exam will require you to fill out a Scantron sheet in response to multiple choice questions, and therefore it is your responsibility to bring a **pencil** and eraser to every exam. You will not be allowed to write the exam if you are more than 30 minutes late, or if another student has already submitted his/her exam, if that occurs first. You may not leave the room (e.g., to use the bathroom) unless you have provided us with medical documentation 24 hours prior to the exam indicating a medical condition that might require you to leave the room. You will have **80** minutes to write each midterm exam, and when time is called you must immediately stop writing, remain quiet and follow the instructions for submitting your exam. This means you will not be given extra time to put your name and/or student ID on you Scantron form or exam, change an answer, etc. Failure to comply with any of these instructions will result in a '0' on your exam.

Missing Exams
If you are aware of scheduled UBC-sanctioned sport travel or a religious obligation that conflicts with the date of an exam, you MUST contact the instructor within the first two weeks of classes so that alternate arrangements can be made. If you miss an exam for the first time due to an acute illness that is likely to be quickly resolved without seeing a health professional, a self-declaration will suffice but you must let the instructor know about your illness as soon as possible so that we can arrange a make-up exam as soon as possible. If you miss an exam for the second time due to a medical reason, you must provide a medical documentation of the illness in order to have a make-up exam. It is your responsibility to schedule a makeup exam **within two (2) weeks** of the original exam date (unless your documentation warrants a longer period). If you miss an exam for any other reason (e.g., work commitments, sleeping in, forgetting there was an exam, etc.), you will receive a "0" on the exam.

Missing Written Assignment
Each of the assignment will be returned a week after it is due. Before the assignment is returned, we accept late assignment with 5% penalty per day. Note that if you hand in the assignment late, you

may not be able to get back the assignment before the midterm.

Missing Labs
If you miss an exam for the first time due to an acute illness that is likely to be quickly resolved without seeing a health professional, a self-declaration will suffice but you must let the instructor know about your illness as soon as possible. If you miss an exam for the second time due to a medical reason, you must provide a medical documentation of the illness in order to get excused for the missed labs. If your missed labs are excused, your final mark for the labs will be re-weighted based on the labs you have attended. Otherwise, you will lose your mark for missing a lab.

Reviewing Exams
There will be one 2-hour exam review period scheduled after the exam marks are released. Your TA will run this review session, and will be available to answer any questions or concerns regarding your exams. Should you be unable to attend this review session, you must contact your TA to make alternative arrangements to see your exam.

Grades
This course is not subject to scaling.

Letter Grade	Percent	Letter Grade	Percent
A+	90 - 100	C+	64-67
A	85 - 89	C	60-63
A-	80 - 84	C-	55-59
B+	76 - 79	D	50-54
B	72 - 75	F	0-49
B-	68 - 71		

Academic Misconduct
Cheating on exams will result in a score of 0 for that exam. Lab assignments must be completed independently. Sharing your answers to lab assignment questions or using another student's work is considered cheating and will result in a score of 0 for that assignment. Using another student's clicker to answer questions for him or her is also considered cheating. If you are caught with more than one clicker in class, both clickers will be confiscated and you will both receive a 0 for course participation. All forms of cheating will be reported to the university for appropriate action.

Psychology Department's Position on Academic Misconduct
Cheating, plagiarism, and other forms of academic misconduct are serious concerns of the University, and the Department of Psychology has taken steps to alleviate them. First, the Department uses software that can reliably detect cheating on multiple-choice exams by analyzing the patterns of students' responses. In addition, the Department subscribes to Turnitin, a service designed to detect and deter plagiarism. All materials (e.g., papers, lab assignments) that students submit for grading may be scanned and compared to over five billion pages of content located on the Internet or in Turnitin's own proprietary databases. The results of these comparisons are compiled into customized "Originality Reports" containing several, sensitive measures of plagiarism; instructors receive copies of these reports for students in their class.

In all cases of suspected academic misconduct, the parties involved will be pursued to the fullest extent dictated by the guidelines of the University. Strong evidence of cheating or plagiarism may result in a zero credit for the work in question. According to the University Act (section 61), the President of UBC has the right to impose harsher penalties including (but not limited to) a failing grade for the course, suspension from the University, cancellation of scholarships, or a notation added to a student's transcript.

If you have any questions as to whether or not what you are doing is even a borderline case of academic misconduct, please consult me. For details on pertinent University policies and procedures, please see Chapter 5 ("Policies and Regulations") in the UBC Calendar (http://students.ubc.ca/calendar).

Access and Diversity
UBC is committed to equal opportunity in education for all students including those with documented physical disabilities or learning disabilities. If you have a disability that affects your learning or performance on tests or exams please visit http://students.ubc.ca/about/access and take the necessary steps to ensure your success at UBC.

Helpful Resources

The Kaleidoscope:
the-kaleidoscope.com
A confidential peer-run mental health support group that takes place on campus at least once a week. You may attend the group if you are experiencing any kind of mental health related challenges, or if you're just feeling stressed about school in general. Registration is not required to attend the group. See the website for meeting times and locations. Food and drink are provided.

Counselling Services:
students.ubc.ca/livewell/services/counselling-services
Phone number: 604-822-3811
Counselling services offers a variety of resources to help you maintain your mental health while in school. You may see a counsellor on an individual basis, attend group counselling, or to document an illness if you should require academic concession.

SpeakEasy: ams.ubc.ca/services/speakeasy/
Phone number: 604-822-9246
A student run service that offers confidential support for students experiencing crisis. Also a good resource for additional information and referrals within the UBC community.

SHARE: www.vivreshare.org
Self Harm Anonymous Recovery and Education is a program designed to promote self care and educate about self harm. SHARE support groups meet biweekly; times and locations can be found on their website.

UBC Wellness Centre: students.ubc.ca/livewell/services/wellness-centre
Phone number: 604-822-8450
Speak with other students about tips for managing stress, keeping healthy sleep and eating patterns, concerns about safe sex and more.

Access and Diversity: students.ubc.ca/about/access
604-822-5844
Access and Diversity provides accommodations for students living with physical or mental disabilities.

Student Health Services: students.ubc.ca/livewell/services/student-health-service
604- 822-7011
Student health provides students with a variety of healthcare related services to help you maintain your health while studying. Access to doctors and registered nurses.

Mood Disorders Clinic UBC: ubc-mooddisorders.vch.ca/
A psychiatric program designed specifically to treat individuals living with depression or bipolar disorder.

Live Well, Learn Well: students.ubc.ca/livewelllearnwell
The Live Well, Learn Well initiative is a resource hub that provides students with information to help improve physical and mental wellbeing.

Mental Health Awareness Club: ubcmhac.sites.olt.ubc.ca/
A club that offers opportunities to speak about mental health with others and strives to promote mental health awareness throughout the UBC community.

Pacific Spirit Addiction Services:
3rd Floor, 2110 West 43rd Ave Vancouver B.C. V6M 2E1
Phone number: 604-267-3970
A free and confidential service for youth and young adults up to the age of 24. Services include counselling, access to an addiction physician - including usage of a methadone maintenance program - and a drug education series.

AMS Food Bank: ams.ubc.ca/services/food-bank/
If you are in a financial emergency AMS food bank can provide you with a food hamper. You are able to use the service up to 6 times each term.

UBC Psychology Clinic: clinic.psych.ubc.ca
Professional psychological services provided to the community, including assessment & treatment for children, adults & families by clinical psychology trainees.

BC Crisis Center: crisiscentre.bc.ca
Phone number: 604-872-3311
Non-profit, volunteer-driven organization that provides emotional support to youth, adults, and seniors in crisis in BC. Crisis line available 24/7.

Distress Line:
Phone number: 1-800-Suicide (784-2433)
If you are in distress or are worried about someone in distress who may hurt themselves, call 1-800-SUICIDE 24 hours a day to connect to a BC crisis line, without a wait or busy signal.

Lecture Schedule

Week	Date	In-Class Topic	Assignments
1	Sept 5	Syllabus, Pre-test, Review	
2	Sept 10	Combinatorics/Probability	Assignment 1 Available
	Sept 12	Random Variables/Probability Distributions	
3	Sept 17	Random Variables/Probability Distributions	
	Sept 19	Non-parametric tests	
4	Sept 24	Non-parametric tests	Assignment 1 due on Sept 24
	Sept 26	Review of Parametric tests and Confidence Interval	
5	Oct 1	Effect size/Power of a test	
	Oct 3	**Midterm 1** (materials up to and including Sept 26);	Assignment 2 Available
6	Oct 8	ANOVA	
	Oct 10	ANOVA	
7	Oct 15,	Multiple-comparison/p-hacking	
	Oct 17	Two-way ANOVA	
8	Oct 22,	Simple Regression	Assignment 2 due on Oct 24
	Oct 24	Multiple Regression	
9	Oct 29,	Regression with Interaction	
	Oct 31	Dummy Code	
10	Nov 5,	**Midterm 2** (materials up to Oct 29);	Assignment 3 Available
	Nov 7	Assumptions/Residual Plots	Project data description due on Nov 7
11	Nov 12,	Resampling (a.k.a. Bootstrap)	
	Nov 14	Resampling (a.k.a. Bootstrap)	
12	Nov 19,	Bayesian Statistics	
	Nov 21	Machine Learning	Assignment 3 due on Nov 21
13	Nov 26,	Project Presentation	Project report due on Nov 26
	Nov 28	Project Presentation	

Note: syllabus is subject to minor changes.

Lab Schedule

Week	Date	Lab Topic
1	Sept 5	No Lab
2	Sept 10	Introduction to R
3	Sept 17	Data structures in R
4	Sept 24	Reading Help Page Importing a dataset Subsetting a dataset
5	Oct 1	Non-parametric test
6	Oct 8	Power of a test
7	Oct 15	ANOVA
8	Oct 22	Two-way ANOVA
9	Oct 29	Regression
10	Nov 5	Regression with Interaction
11	Nov 12	Assumptions/Residual Plots
12	Nov 19	Resampling
13	Nov 26	Machine Learning

Note: The lab content is subject to change.