

**University of Waterloo**  
**GBDA 205 Quantitative Methods**  
**Winter 2019**  
**Course Outline**

**Instructor:** Vivian Xiaofei Yang

**Office:** PAS 1049

**Phone:** 519-888-4567 Ext. 37073 (emails are preferred over voicemail messages)

**E-mail:** [vivyang@uwaterloo.ca](mailto:vivyang@uwaterloo.ca)

**Lecture Hours & Location:**

- Section 001: 8:30- 9:50pm, Mondays and Wednesdays, RCH 211
- Section 002: 10:00- 11:20pm, Mondays and Wednesdays, RCH 211

**Office Hours and Office Location:** PAS 1049, 11:30am to 12:30pm on Mondays and Wednesdays and by appointments

**Course Description:**

This course is designed as an introduction to quantitative data analysis, covering basic descriptive and inferential statistical techniques used in analyzing social science research data. Students are not expected to be math wizards, but rather will be walked through the basics of quantitative methods with the goal of becoming effective data analysts. As such, emphasis in this course will be placed on the logic of quantitative methods rather than the math behind the statistics.

The learning objectives of this course are that students:

- are able to identify the assumptions and limits of statistical tests
- become more familiar with ways to organize and analyze data
- understand which test is appropriate to answer a particular research question
- use a common statistical software, SPSS, to perform statistical analysis
- are able to communicate research results and translate statistical jargons into meaningful English

The topics covered in this course can be found in the later section of *Tentative Class Schedule*.

**Email**

I may not always have access to voicemail. As such, **email is a preferred** way to reach me. I will try my best to respond as soon as I can. Please include “GBDA 205” and your section # of “001” or “002” in the subject line.

**Attendance Policy**

All class assessment items will be based on class lectures. Therefore, attending classes and taking good notes are very important. Students are expected to attend all scheduled classes in the term to keep up with course material. This is especially important as the material builds each week.

**Textbook**

Roberts, L.W., Edgerton, J., Peter, T., & Wilkinson, L. (2015), *Understanding Social Statistics*, Oxford University Press, ISBN-13: 9780195444292

The lectures will roughly follow the textbook, but often will not cover every chapter. Conversely, lectures sometimes will go beyond what is covered in the text. Class notes and additional readings (if applicable) will be posted on LEARN periodically.

## **Resources**

All supplementary course materials (lecture slides/notes, assignments, announcements, etc.) will be posted on LEARN, <http://learn.uwaterloo.ca>

## **Statistic Software**

We will use SPSS as the statistic software for this class. Please refer to *Online Assignments and SPSS Exercises* section in this syllabus.

To access SPSS, you have two options. The first is using computer labs equipped with SPSS software out of class time, which are located in PAS 1080, PAS 1098, PAS 1099 and PAS 1237.

The second option is by accessing SPSS remotely. Due to the limited resources, in class time we will not be able to have access to computer labs installed with SPSS. As a result, students of GBDA 205 are granted access to SPSS as a virtual application for the Winter 2019 term. You will be able to access SPSS remotely from your own computers or on campus computer labs that are not equipped with SPSS. For instruction on how to access SPSS remotely, please go to: <https://uwaterloo.ca/arts-computing/students/remote-access-software>

## **Electronic Device Policy**

Cell phones, pagers, and other electronic devices must be either turned off or muted during classes. Laptops are permitted in class for note-taking and in-class activities only. Devices must be closed, disabled, and/or set aside when requested by the instructor. Students who do not comply with the electronic device policy may be asked to leave a class. Students who have made arrangements through the Office for Students with Disabilities may use electronic devices as an academic accommodation related to their disability.

## **Grading**

Category	Weight	Date	Note
Clicker questions	15%	In class	
SPSS exercises (four)	12%	Please see the tentative lecture schedule.	Submitted by the end of the day on LEARN
Online Assignments (four)	12%	Please see the tentative lecture schedule.	Submitted by the end of the day on LEARN
Individual Project	16%	Proposal due by Feb 1 (Friday) and Final report due by April 3 (Wednesday)	Submitted by the end of the day on LEARN
Midterm	15%	Feb 27 (W) in Class	In Class
Final Exam (Comprehensive)	30%	Scheduled by the Registrar	

## **Clicker Questions**

This course will be using the i>clicker student response system in class. i>clicker helps me to understand whether you have grasped the concepts and adjust class progress accordingly and also gives everyone a chance to participate in class.

### ***i. Why are clickers used in this course?***

Quote from Wood's paper *Clickers: A Teaching Gimmick that Works*, describes advantages of using clickers in a large class for both students and instructors.

“For the students:

- They are answering anonymously - no one has to worry about the possible humiliation of giving a "dumb" answer.
- Those who did not "get it" realize they are not the only ones. In a typical lecture situation, such students are often inhibited from asking a question by the belief "everyone but me probably understood."

- Those who apparently did not "get it" often find out the reason was not their lack of knowledge, but an unclear or ambiguous question from the instructor.
- Most important, the students are actively engaged with the topic at hand and, therefore, more likely to understand and retain it better than if they were only sitting passively and listening to the instructor.

For the instructor:

- S/he can later find out from the software which students are present and give credit, if desired, for in-class participation.
- S/he knows immediately, in real time, what fraction of the students didn't "get it," information that often does not become apparent in a standard lecture course until after the next exam, when it's too late to do much about it".

## ii. Registration of your i>clicker

Students are responsible for buying a clicker (first generation clickers or the new version of clickers both work), bringing it to every class and ensuring that the batteries work.

You must register your i>clicker in order to receive participation credit. I cannot match your answers to your name unless you register your i>clicker to your name using UW internal registration link

Below is an instruction of how to register your i>clicker from UW's i<clicker FAQ page.

*"To register your clicker in your LEARN course, you will find a link to the clicker registration page somewhere on the Content tab (under Syllabus folder) within the LEARN/D2L course.*

*Follow the instructions on this registration page to enter your clicker ID number (located on the back of the clicker) into the answer box.*

*If you replace your clicker then register the new clicker ID number in the same manner as above.*

*The clicker ID number is printed on the back of the clicker near the bottom, sometimes in very small type. An example is 12873CAB. Other numbers on the back like T24-RLR13 or 6495A-RLR13 are **not** clicker IDs. Clicker ID numbers sometimes use the numeral 0 (zero) or 1 (one), but never use the capital letter O (Oh) or lowercase letter l (el). Ask a fellow student or your instructor if you can't locate the clicker ID"*

Registration is only needed once. A single registration will work for all your clicker courses and all terms. Your registration on official clicker webpage is **NOT** going to work for our purposes. Please use the UW internal registration listed above for registering your i>clicker. FAQ for students about clickers can be found on the following link: <http://www.math.uwaterloo.ca/~pkates/CTE/clickers/clicker-student-faq.html#faq-register-what>

There are two sections of GBDA 205. **However, students need to go to the section that he/she registers.** I<clicker responses will **NOT** be counted if a student goes to the wrong section as the receiver cannot link the signal received with the correct student name/ID.

## iii. Grading Policy

Class participation will begin in the **second week of classes** (Week of January 14 to 18). The clicker grade considers both response rate (i.e., how many questions you have answered out of total questions asked) and performance (i.e., how many questions you have answered **CORRECTLY** out of total questions).

i>clicker grade will account for 15% of your overall grade for this course. To receive a full mark for the clicker grade, you will need to answer at least 80% of total questions asked (participation portion) and 50% of total questions correctly (performance portion). As these percentages (80% and 50%) already take into consideration special situations (e.g., sick days or other conflicts and times you forget to bring your clicker to class), being sick will not exempt you or shift the weight of clicker grade for that day.

The following is a hypothetical example of how this grade is calculated.

**Example:**

Likely there will be 18 to 20 sessions overall with clicker questions through the semester and between 1 to 4 questions for each session. Assume there are 60 clicker questions in total and you miss 3 sessions or 10 clicker questions (due to absence for various reasons) i.e., answering 50 clicker questions. Also assume out of the 50 questions, you answer 36 questions correctly. According to this, the percentage of response is 83% ( $=50/60$ ) and accuracy is 60% ( $=36/60$ ). As such, both the response percentage and accuracy are higher than the 80% and 50%, respectively. You receive a full mark for the 15% participation grade.

The clicker grade will be updated twice on LEARN throughout the semester, once during the term and once more at the end of the semester. Students are responsible for checking their clicker grade once posted and notifying the lecturer of any potential issues in a timely manner.

#### ***iv. Cheating***

I consider bringing a fellow student's i>clicker to class to be cheating and a violation of the ***Academic Integrity***. If you are caught with a remote other than your own or have votes in a class that you did not attend, you will forfeit all clicker points and may face additional disciplinary action.

#### **Online Assignments and SPSS Exercises**

Your grade is based on your performance in learning fundamental statistics concepts and applying them to solve problems. It is important to understand statistical techniques, and equally critical to learn at least one computer statistical software to perform the analysis as real-world data sometimes is too large to analyze or calculate manually. IBM® SPSS® Statistics Software is a common statistical analysis software package that we will be using in this course.

Through the term, four online assignments and four SPSS exercises will be assigned. Feel free to work in groups as they are supposed to be learning experiences. However, each student must submit their **own individual** assignments/SPSS exercises online. Copying other students' answers without understanding the material will result exam performance will suffer.

**No late assignments/SPSS exercises** will be accepted, as there will be sufficient time to finish. Being sick is not an excuse for missing the deadline, unless there are special circumstances, which are subject to the instructor's judgement.

#### **Individual Projects**

The best way to understand something is to experience it for yourself, which is the purpose of this individual project. The project generally involves the following steps.

1. Choose your variable(s) and identify a research question
2. Devise a plan to collect your data
3. Submit a project proposal to the instructor and obtain approval (**Due by Feb 1, Friday**)
4. Once your research question and data collection plan are approved, carry out your research:
  - a) Collect and organize data
  - b) Conduct the appropriate analysis
  - c) Write your results in a report
5. Submit your written report. (**Due by April 3, Wednesday**)

Your project proposal is worth 2% and the final report is worth 14%, 16% in total. The Proposal will only be graded as pass or fail, i.e. 2% or 0%. Comments and suggestions are only provided to Proposals receiving 0% to assist students revise the plan needed to write the final report.

Further details on proposal and rubric of the final individual project report will be posted on LEARN.

#### **Midterm and Final**

The midterm is in class and takes the full lecture session, i.e., one hour and 20 minutes. There is **no deferred**

**or make-up mid-term.** If you miss the midterm due to illness and have valid medical documentation, the weight of the midterm will be shifted to the final exam. Otherwise, a mark of zero will be given for the missed midterm.

The final exam is cumulative and will be scheduled by Registrar's Office. If a student is sick on the exam day, deferral of final examination is **NOT** automatic upon the presentation of suitable medical verification. The instructor will use this documentation together with other information to determine whether accommodation is warranted.

According to Registrar's Office [Accommodation Due to Illness policy](#)

*"If a student is granted an accommodation to postpone a final examination, they shall write the exam the next time the course is taught or during the next term the student is on campus, whichever is sooner".*

Extra credits might be given in class without notice. The number of extra credits and whether extra credits will be given depend on class progress and average performance in the midterm.

---

## Tentative Class Schedule

\*There is **no differentiation between Monday and Wednesday classes**, with both being lectures. Tutorials on SPSS exercises (labs) may be provided by TAs outside class time throughout the term. The final delivery of the topics and time below may change due to class ability and interest in the lecture materials.

# of week	Week of	Date	Topics		Chapters from the	SPSS Exercises and Assignments during the week; Notes
1	Jan 7 to Jan 11	Jan 7 (M)	Introduction	Syllabus; Introduction	Chapter 1, 2 and 3	
		Jan 9 (W)	Univariate Analysis	Review: Introduction to univariate Analysis; Measures of Central Tendency; Measures of Dispersion; and Charts and Graphs	Chapter 4, 5, 6 and 7	
2	Jan 14 to Jan 18	Jan 14 (M)		The Normal Curve	Chapter 8	
		Jan 16 (W)				
3	Jan 21 to Jan 25	Jan 21 (M)				<b>SPSS exercise 1 due by Friday (Jan 25) and Homework 1 Due by Sunday (Jan 27)</b>
		Jan 23 (W)				
4	Jan 28 to Feb 1	Jan 28 (M)	Bivariate Analysis	Understanding Relationships; Bivariate Tables; and Scatterplot Analysis	Chapter 9, 10 and 11	<b>Proposal of individual project is due by Friday (Feb 1)</b>
		Jan 30 (W)				
5	Feb 4 to Feb 8	Feb 4 (M)	Correlation and Regression	Correlation coefficients; Regression analysis (Bivariate and Multivariate)	Chapter 14 and 17	
		Feb 6 (W)				
6	Feb 11 to Feb 15	Feb 11 (M)				<b>SPSS exercise 2 due by Friday (Feb 15) and Homework 2 Due by Sunday (Feb 17)</b>
		Feb 13 (W)				
7	Feb 18 to Feb 22	Feb 18 (M)	<b>Family day and Spring Break week</b>			
		Feb 20 (W)				
8	Feb 25 to Mar 1	Feb 25 (M)	<b>Catch-up and review of Mid-term</b>			
		Feb 27 (W)				
9	Mar 4 to Mar 8	Mar 4 (M)	Sampling	Samples and Population; Sample sizes and UX	Chapter 18 and Lecture Notes	
		Mar 6 (W)				
10	Mar 11 to Mar 15	Mar 11 (M)	Inference	Point Estimates, Confidence Intervals and Confidence Levels	Chapter 19	<b>SPSS exercise 3 due by Friday (March 15) and Homework 3 Due by Sunday March 17</b>
		Mar 13 (W)				
11	Mar 18 to Mar 22	Mar 18 (M)		Hypothesis Testing	Chapter 20	
		Mar 20 (W)				
12	Mar 25 to Mar 29	Mar 25 (M)		Various Significance Tests	Chapter 21 and Lecture Notes	
		Mar 27 (W)				
13	April 1 to April 5	April 1 (M)	<b>Last day of Class, Catch-up and Final review</b>			
		April 3 (W)				

**Institutional-required statements for undergraduate course outlines approved by Senate Undergraduate Council, April 14, 2009**

***Academic Integrity:*** In order to maintain a culture of academic integrity, members of the University of Waterloo are expected to promote honesty, trust, fairness, respect and responsibility. See the [UWaterloo Academic Integrity webpage](#) and the [Arts Academic Integrity webpage](#) for more information.

***Discipline:*** A student is expected to know what constitutes academic integrity, to avoid committing academic offences, and to take responsibility for his/her actions. A student who is unsure whether an action constitutes an offence, or who needs help in learning how to avoid offences (e.g., plagiarism, cheating) or about “rules” for group work/collaboration should seek guidance from the course professor, academic advisor, or the Undergraduate Associate Dean. When misconduct has been found to have occurred, disciplinary penalties will be imposed under Policy 71 – Student Discipline. For information on categories of offenses and types of penalties, students should refer to [Policy 71 - Student Discipline](#). For typical penalties check [Guidelines for the Assessment of Penalties](#).

***Grievance:*** A student who believes that a decision affecting some aspect of his/her university life has been unfair or unreasonable may have grounds for initiating a grievance. Read [Policy 70 - Student Petitions and Grievances](#), Section 4. When in doubt, please be certain to contact the department’s administrative assistant who will provide further assistance.

***Appeals:*** A decision made or penalty imposed under Policy 70 - Student Petitions and Grievances (other than a petition) or Policy 71 - Student Discipline may be appealed if there is a ground. A student who believes he/she has a ground for an appeal should refer to [Policy 72 - Student Appeals](#).

***Note for students with disabilities:*** The [AccessAbility Services](#) office, located on the first floor of the Needles Hall extension (1401), collaborates with all academic departments to arrange appropriate accommodations for students with disabilities without compromising the academic integrity of the curriculum. If you require academic accommodations to lessen the impact of your disability, please register with the AS office at the beginning of each academic term.

**Other sources of information for students:**

[Academic Integrity website \(Arts\)](#)

<https://uwaterloo.ca/arts/current-undergraduates/student-support/ethical-behaviour>

[Academic Integrity Office \(UWaterloo\)](#)

<https://uwaterloo.ca/academic-integrity/>