

# STAT 344 – SURVEY SAMPLING (Fall 2021)

**Date/Time/Room:** MWF 2pm - 3pm, Sept 7 – Dec 7, 2021, Math 100

**Class webpage:** UBC Canvas STAT344.

**Instructor:** Lang Wu, Professor, Department of Statistics, UBC.

Personal webpage: <https://www.stat.ubc.ca/~lang>

Email: lang@stat.ubc.ca

Office: *Earth Science Building (ESB) 3126*, 2207 Main Mall.

**Office hours:** See Canvas.

**Teaching assistants:** see Canvas.

**Email policy:** Due to large volumes of emails the instructor receives daily, the instructor may be unable to respond individual emails on time. *Please use email for confidential and personal matters only.* Please use the online **Piazza discussion board** on Canvas to discuss course materials.

**Text:** There is no suitable textbook at this level. Therefore, the lecture notes posted on Canvas will define the course materials. Some references are listed here, which can be freely accessed online via the UBC library.

**Prerequisite:** STAT 200 (or similar introductory statistics course)

**Co-requisite:** MATH/STAT 302 (or similar introductory probability course)

**Lecture:** Lecture slides will be posted on Canvas. We will fill in many details and gaps in the slides during the class. Some classes will involve *in-class activities*. The lectures will be *in-person* in Math 100. Lecture records and marked slides will be posted on Canvas after each lecture.

**Lab:** Labs start in the second week of class. Typically, there will be a small, for-credit exercise for the group to submit on Canvas by **11:59pm on Fridays**. Please see Canvas for more details.

**Homework:** Homework assignments are to be completed via the WeBWorK online homework system (access via Canvas). There will be roughly seven homework assignments. The schedules of these assignments will depend on lecture schedules which may be adjusted throughout the term. Please see Canvas for more details. You have roughly one week to complete each WeBWorK assignment. No late homework will be accepted. No credits will be given for missing homework.

**Project:** There will be one group project to be posted before the midterm and due after the midterm. Please see Canvas for details.

**Piazza discussion board:** We will use the Piazza online platform (access via Canvas) to allow students, TAs, and the instructor to discuss course materials. *In particular, queries about course materials should be posted to Piazza, not emailed to a TA or the instructor.* Bearing in mind that the TAs and the instructor will be spending time moderating and posting to Piazza.

**Announcements:** Class announcements will be sent via emails, such as new WebWork assignments. Please check your emails daily.

**Software:** We will use software R frequently in class/lab to illustrate the basic ideas. You will also need R to complete some WeBWorK questions and the project. If you are unfamiliar with R, please learn the basics as soon as possible. There are many free R tutorials on the internet. TAs will also review R basics in the labs.

**Exams:** There will be a midterm exam and a final exam. Tentative schedule of the midterm exam is **Friday, October 29, 2021** (in class, 50 minutes). No makeup exams. If you miss a midterm with good reasons (e.g., sick), the midterm weight will be transferred to your final exam. If you miss the final exam with good reasons, you have to apply for a deferred final exam through your Faculty (e.g., Faculty of Science). Both midterm exam and final exam will be **in-person**. If you cannot take either one in-person, you have to apply a possible on-line version through Faculty of Science Advising Office. Please see Canvas for more details.

**Evaluation:** WeBWorK assignments: 10%, Lab assignments: 5%, Group project: 10%, Midterm: 25%, Final Exam: 50%. The weights may be adjusted if necessary.

### Lecture topics:

1. Fundamentals of random sampling and inferences about populations; review of applicable material from introductory statistics.
2. Ratio and regression estimation; estimation in domains; stratification.
3. Cluster sampling.
4. Sampling weights; biased sampling.
5. Nonresponse, missing data
6. Miscellaneous topics

### References:

- Lohr, S.L. (1999 1st ed., 2010 2nd ed.) Sampling: Design and Analysis. Duxbury Press.
- Lumley, T. (2010) Complex Surveys: A Guide to Analysis Using R. Wiley.
- Rao, P.S.R.S. (2000) Sampling methodologies with applications. Chapman & Hall.