

THE GEORGE WASHINGTON UNIVERSITY
Department of Statistics
2021 Fall
Sample Surveys
STAT 6287 SYLLABUS

Instructor & TA: Zejin Gao

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Office hours: Monday: 11:30AM-12:30PM; Wed.: 5:00PM-6:00PM

Teaching Assist: TBD

Phone:

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Course Description:

- Practical aspects and basic theory of design and estimation in sample surveys for finite populations
- Simple random, systematic, stratified, cluster multistage, and unequal-probability sampling
- Horvitz-Thompson estimation of totals and functions of totals: means, proportions, and regression coefficients
- Linearization technique for variance estimation
- Model-assisted ratio and regression estimation
- Two-phase sampling, sampling on two occasions, non-response effects, imputation, and other selected topics

Course Prerequisite:

STAT 4157 and STAT 4158.

Textbook:

Särndal, Swensson, Wretman: Model Assisted Survey Sampling, either the hardback or the paperback version, Springer.

Learning Outcomes: As a result of taking this course, students will be able to do the following:

- Describe elements of planning a survey, especially the relationship of the population, frame, sampling scheme, and sample;

- Discuss unequal inclusion probabilities, reasons they arise, rationales for using them, and methods of implementation;
- Contrast, evaluate, and implement element sampling designs, including simple random, systematic, probability proportional to size, and stratified sampling;
- Discuss the relationships among estimators, sample inclusion indicators, finite population characteristics, parameters, and properties of estimators;
- Explain the usefulness of cluster sampling and its disadvantages;
- Describe the rationale for and statistical properties of estimators more complex than means including ratio and regression estimators;
- Illustrate concepts with numerical examples and perform computations for survey applications;
- Utilize commands in the R statistical program and in SAS for analyzing data from finite population surveys and summarize results.

Grading: Your final letter grade will be based on weighted average: 35% Homework, 35% Midterm Exam, and 30% Final Exam.

No incomplete grades will be assigned for marginal or failing grades at the end of the semester. There will be no extra work available to improve your final grade. Your grade will be determined as outlined above. **There will be no exceptions**

Class Attendance
Class discussions will extend the materials covered in the textbook. Therefore, it is important that you attend the class. You are responsible for any materials covered or any announcements made in class, even if you are not present.

Amount of Time on Direct and Independent Learning: It is expected that students spend 150 minutes in classroom on lecture plus 300 minutes of independent learning per week.

Homework: Late homework will not be accepted.

Computing

Statistical Packages: You will need to use a statistical package in order to perform most of the statistical analyses covered in this course. R is a freeware that we will use extensively in this course. Please google “download R” to download R 4.0.1 and install it to your computer. Please read the Appendix of the textbook for more information about downloading R.

Disabilities and religious observance

We will follow university policy in regard to observance of religious holidays and accommodations of disability. Students anticipating the observance of religious holidays impacting course schedule should let the instructor know during the first week of

class. You may contact Professor Li via email or phone in this regard or discuss your situation in person.

Students needing accommodation for disabilities should let the instructor know during the first week of class, or as soon as possible if your status changes. Any student who may need an accommodation based on the potential impact of a disability should contact the Disability Support Services office at 202-994-8250 in the Student Center, Suite 242, to establish eligibility and to coordinate reasonable accommodations. For additional information, please refer to <http://gwired.gwu.edu/dss/>

Additional notes

University Police Department is located at Woodhull House, 2033 G Street.

Emergency: 202-994-6111. Non-emergency: 202-994-6110. Otherwise: 911.

Weather advisories and emergencies affecting campus: <http://campusadvisories.gwu.edu/>

GWU Emergency Management: 202-994-4936

Emergency Preparedness and Response at The George Washington University To Report an Emergency or Suspicious Activity

Call the University Police Department at 202-994-6111 (Foggy Bottom) or 202-242-6111 (Mount Vernon).

Shelter in Place

Although it is unlikely that we will ever need to shelter in place, it is helpful to know what to do just in case. No matter where you are, the basic steps of shelter in place will generally remain the same.

- If you are inside, stay where you are unless the building you are in is affected. If it is affected, you should evacuate. If you are outdoors, proceed into the closest building or follow instructions from emergency personnel on the scene.
- Locate an interior room to shelter inside. If possible, it should be above ground level and have the fewest number of windows. If sheltering in a room with windows, move away from the windows. If there is a large group of people inside a particular building, several rooms may be necessary.
- Shut and lock all windows (tighter seal) and close exterior doors.
- Turn off air conditioners, heaters, and fans. Close vents to ventilation systems as you are able. (University staff will turn off ventilation as quickly as possible).
- Make a list of the people with you and ask someone to call the list in to UPD so they know where you are sheltering. If only students are present, one of the students should call in the list.
- Await further instructions. If possible, visit Campus Advisories for incident updates (<http://CampusAdvisories.gwu.edu>) or call the GW Information Line 202-994-5050.
- Make yourself comfortable and look after one other. You will get word as soon as it is safe to come out.

Evacuation

An evacuation will be considered if the building we are in is affected or we must move to a location of greater safety. We will always evacuate if the fire alarm sounds. In the

event of an evacuation, please gather your personal belongings quickly (purse, keys, GWorld card, etc.) and proceed to the nearest exit. Do not use the elevator. Once you have evacuated the building, proceed to our primary rendezvous location.

Alert DC

Alert DC provides free notification by e-mail or text message during an emergency. Visit Campus Advisories for a link and instructions on how to sign up for alerts pertaining to GW.

Emergency Information

Additional emergency information may be obtained by visiting the Campus Advisories webpage (<http://CampusAdvisories.gwu.edu>) or calling the GW Information Line at 202-994-5050.

ACADEMIC INTEGRITY

I personally support the GW Code of Academic Integrity. It states: “Academic dishonesty is defined as cheating of any kind, including misrepresenting one's own work, taking credit for the work of others without crediting them and without appropriate authorization, and the fabrication of information.” For the remainder of the code, see: <http://www.gwu.edu/~ntegrity/code.html>

University Policy on Religious Holidays:

1. Students should notify faculty during the first week of the semester of their intention to be absent from class on their day(s) of religious observance;
2. Faculty should extend to these students the courtesy of absence without penalty on such occasions, including permission to make up examinations;
3. Faculty who intend to observe a religious holiday should arrange at the beginning of the semester to reschedule missed classes or to make other provisions for their course-related activities.

SUPPORT FOR STUDENTS OUTSIDE THE CLASSROOM

Virtual academic support

A full range of academic support is offered virtually in fall 2020. See <https://coronavirus.gwu.edu/top-faqs> updates.

Tutoring and course review sessions are offered through Academic Commons in an online format. See academiccommons.gwu.edu/tutoring

Writing and research consultations are available online. See academiccommons.gwu.edu/writing-research-help

Coaching, offered through the Office of Student Success, is available in a virtual format. See studentsuccess.gwu.edu/academic-program-support

Academic Commons offers several short videos addressing different virtual learning strategies for the unique circumstances of the fall 2020 semester. See academiccommons.gwu.edu/study-skills. They also offer a variety of live virtual workshops to equip students with the tools they need to succeed in a virtual environment. See tinyurl.com/gw-virtual-learning

Writing Center

GW's Writing Center cultivates confident writers in the University community by facilitating collaborative, critical, and inclusive conversations at all stages of the writing process. Working alongside peer mentors, writers develop strategies to write independently in academic and public settings. Appointments can be booked online. See gwu.mywconline.

Academic Commons

Academic Commons provides tutoring and other academic support resources to students in many courses. Students can schedule virtual one-on-one appointments or attend virtual drop-in sessions. Students may schedule an appointment, review the tutoring schedule, access other academic support resources, or obtain assistance at academiccommons.gwu.edu.

Disability Support Services (DSS) 202-994-8250

Any student who may need an accommodation based on the potential impact of a disability should contact Disability Support Services to establish eligibility and to coordinate reasonable accommodations. disabilitysupport.gwu.edu

Counseling and Psychological Services 202-994-5300

GW's Colonial Health Center offers counseling and psychological services, supporting mental health and personal development by collaborating directly with students to overcome challenges and difficulties that may interfere with academic, emotional, and personal success. healthcenter.gwu.edu/counseling-and-psychological-services

Safety and Security

1. In an emergency: call GWPD 202-994-6111 or 911
2. For situation-specific actions: review the Emergency Response Handbook at safety.gwu.edu/emergency-response-handbook
3. In an active violence situation: Get Out, Hide Out, or Take Out. See go.gwu.edu/shooterpret
4. Stay informed: safety.gwu.edu/stay-informed