

**SOCI 328 SOCIAL STATISTICS I (SECTION 101)**  
**SEP – DEC 2019**

**Instructor:** Dr. Gerry Veenstra  
**Office:** ANSO 1321  
**Office Hours:** Wed 1:00–2:00 pm  
**Email:** gerry.veenstra@ubc.ca

**Teaching Assistant:** Adam Vanzella Yang  
**Office:** ANSO 2316  
**Office Hours:** Thurs 12:30–1:30 pm  
**Email:** adamvy@mail.ubc.ca

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## **Course Description**

This course introduces students to elementary techniques of quantitative data analysis common in sociological research. It emphasizes selection of appropriate statistical techniques, examination of assumptions associated with them and interpretation of the results provided by them. The course does not emphasize complex calculations or memorization of complex formulae.

## **Prerequisite and Anti-requisites**

Three credits of 100-level SOCI is the only prerequisite for this course. The Science Credit Exclusion List in the UBC Calendar indicates that UBC students cannot apply credits from any two of the following introductory statistics courses to their UBC degrees: STAT 200, 203, BIOL 300, COMM 291, ECON 325, EPSE 482, 483, FRST 231, GEOG 374, KIN 371, POLI 380, PSYC 218, 278, 366, SOCI 328.

## **Textbook**

Garner, Roberta. 2010. *The Joy of Stats. Second Edition*. Toronto: The University of Toronto Press. Available at the UBC Bookstore, in ebook format at the University of Toronto Press website and in Kindle format at Amazon.ca.

## **Evaluation**

Evaluation is based on four assignments (5% each), a midterm exam (30%) and a final exam (50%). The assignments involve applying statistical techniques to real data using statistical software. The exams are comprised of multiple choice and/or short answer questions. There are no opportunities for extra credit.

## **Lectures**

There will be some lecturing by the instructor but large chunks of class time will be comprised of small groups of students completing exercises and working on assignments. **Students are expected to have read the relevant slides and textbook beforehand and come to class ready to implement the ideas described in these materials in a practical way.**

## **Statistical Software**

This course uses the statistical software package jamovi. jamovi is open-source software for Windows, Mac and Linux which can be downloaded for free at [www.jamovi.org](http://www.jamovi.org). We will apply jamovi to two datasets throughout the semester: a dataset comprised of characteristics of 1,500 adult Canadians (Statistics Canada's General Social Survey on Time Use) and a dataset comprised of characteristics of 154 countries.

## **Canvas**

This course uses the learning analytics platform Canvas for assignment submissions and reporting of assignment and midterm exam grades. The following materials are also available in Canvas:

- Lecture slides
- GSS and Country datasets
- Descriptions of variables in the GSS and Country datasets
- Practice questions (multiple choice and short answer)

## **In-term Concession**

Students are expected to regularly attend classes and submit assignments and write examinations at the scheduled times. Students who encounter medical, emotional or personal problems that affect their ability to complete assignments or write examinations should be aware of the following course policies:

- First missed assignment: Submit the Student Self-Declaration form available on the Arts Academic Advising website to the instructor. If in-term concession is granted the final assignment grade will be calculated from the three completed assignments.
- Second missed assignment: Submit the Request for Academic Concession and Student Self-Declaration forms to Arts Academic Advising Services. If in-term concession is granted the final assignment grade will be calculated from the two completed assignments.
- Missed midterm exam: Submit the Request for Academic Concession and Student Self-Declaration forms to Arts Academic Advising Services. If in-term concession is granted a make-up exam will be held later in the semester.

## **University Policies**

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.

## Copyright

All materials of this course (course handouts, lecture slides, assessments, etc.) are the intellectual property of the course 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. **Please note that recording lectures is not permitted.**

## Assignments

Assignment 1 (due **Oct 3** @ 3:00 pm): Add a new categorical variable to the Country dataset. Where did you obtain the data and how trustworthy is the data source? What exactly is the variable measuring and what is its level of measurement? Next, use jamovi to describe and summarize the distribution of values for the variable. Feel free to copy and paste output tables from jamovi into your assignment. Now repeat the process with a quantitative variable that you have also added to the Country dataset. Students are allowed to work in teams of two or three people and hand in one version of an assignment on behalf of the team but can also work alone if desired. Assignments and accompanying datasets should be submitted online in Canvas. Late assignments will be penalized 10% per day. Assignments submitted after 3:00 pm on the due date are deemed to be one day late.

Assignment 2 (due **Oct 31** @ 3:00 pm): Use jamovi to investigate the bivariate association between two categorical variables in the Country dataset. At least one of these variables should be an original addition to the dataset (perhaps the categorical variable you obtained for Assignment 1).

1. *Theoretical rationale*: How would you expect the two variables to be related? Are they likely to be strongly or weakly related, do you think? Is one likely to cause or influence the other? Do this *before* examining the relationship between the two variables.
2. *Examining each variable individually*: What do the variables measure or assess? What are their levels of measurement? What do their distributions look like in this dataset?
3. *Examining the relationship between the variables*: Describe and summarize the relationship between the two variables. You may have to recode or transform the variables to make the relationship more intelligible. How are the variables related to one another, if at all? If they *are* related, how strong is the relationship?
4. *Interpretation*: Provide some interpretive insights regarding the relationship between the variables. Were your theoretical expectations met?

Present your analyses and insights in sentence and paragraph form (accompanied by attractive graphs and/or tables) as if you were writing a formal report for public consumption; assume your readers don't know much about statistics. Students are allowed to work in teams of two or three people and hand in one version of an assignment on behalf of the team but can also work alone if desired. Assignments and accompanying datasets should be submitted online in Canvas. Late assignments will be penalized 10% per day. Assignments submitted after 3:00 pm on the due date are deemed to be one day late.

Assignment 3 (due **Nov 14** @ 3:00 pm): Use jamovi to investigate the bivariate association between two quantitative variables in the Country dataset. At least one of these variables should be an original addition to the dataset (perhaps the quantitative variable you obtained for

Assignment 1). Follow the template for Assignment 2. Students are allowed to work in teams of two or three people and hand in one version of an assignment on behalf of the team but can also work alone if desired. Assignments and accompanying datasets should be submitted online in Canvas. Late assignments will be penalized 10% per day. Assignments submitted after 3:00 pm on the due date are deemed to be one day late.

Assignment 4 (due **Nov 21** @ 3:00 pm): Use jamovi to investigate the bivariate association between a categorical variable and a quantitative variable in the Country dataset. At least one of these variables should be an original addition to the dataset (perhaps one of the variables you obtained for Assignment 1). Follow the template for Assignment 2. Students are allowed to work in teams of two or three people and hand in one version of an assignment on behalf of the team but can also work alone if desired. Assignments and accompanying datasets should be submitted online in Canvas. Late assignments will be penalized 10% per day. Assignments submitted after 3:00 pm on the due date are deemed to be one day late.

## Schedule

### *Unit 1: Introduction (Sep 4)*

- *Topics:* Statistics in sociology; course objectives
- *Readings:* Garner pp. 17–27, pp. 287–317 (math refresher)

### *Unit 2: Variables (Sep 9 and 11)*

- *Topics:* Units of analysis; variables; levels of measurement
- *Readings:* Garner pp. 29–41

### *Unit 3: Causality (Sep 16)*

- *Topics:* Criteria for causality; multivariate causal scenarios
- *Readings:* Garner pp. 41–45

### *Unit 4: Sampling (Sep 18)*

- *Topics:* Descriptive and inferential statistics; parameters and statistics; sampling strategies
- *Readings:* Garner pp. 46–49

### *Unit 5: Summarizing variables (Sep 23 and 25)*

- *Topics:* Frequency tables; pie charts and bar charts; central tendency (mean, median, mode); dispersion (range, interquartile range, standard deviation); shape (histogram, stemplot, boxplot); transformations
- *Readings:* Garner pp. 55–67, pp. 70–79

### *Unit 6: Probability models (Sep 30 and Oct 2)*

- *Topics:* Randomness; probability models; normal distributions; sampling distributions; Central Limit Theorem
- *Readings:* Garner pp. 87–117, pp. 121–127

*Assignment 1 due Oct 3 @ 3:00 pm*

*Unit 7: Confidence intervals (Oct 7)*

- *Topics:* Confidence intervals for means and proportions
- *Readings:* Garner p. 128
- *Supplementary readings:* Garner pp. 128–135

*Unit 8: Tests of significance (Oct 9)*

- *Topics:* Logic of hypothesis testing; Type I and Type II errors
- *Readings:* Garner pp. 135–142

*No class Oct 14*

*Unit 9: Bivariate associations (categorical by categorical) (Oct 16 and 21)*

- *Topics:* Contingency tables; % differences; Chi-squared test of significance; Cramer's V; Kendall's tau-b
- *Readings:* Garner pp. 153-155, p. 157, pp. 191–199

*Midterm exam review (Oct 23)*

*Midterm exam for Units 1–8 (Oct 28)*

*Unit 10: Bivariate associations (quantitative by quantitative) (Oct 30, Nov 4 and 6)*

- *Topics:* Scatterplots; Pearson's  $r$ ; OLS regression line; Spearman's rho
- *Readings:* Garner pp. 156, pp. 166–186

*Assignment 2 due Oct 31 @ 3:00 pm*

*No class Nov 11*

*Unit 11: Bivariate associations (categorical by quantitative) (Nov 13)*

- *Topics:* Comparing central tendencies, dispersions and shapes; oneway ANOVA
- *Readings:* Garner pp. 157–158, pp. 203–209

*Assignment 3 due Nov 14 @ 3:00 pm*

*Unit 12: Multiple regression (Nov 18 and 20)*

- *Topics:* Multivariate causal scenarios (again); multiple regression
- *Readings:* Garner pp. 159–165, pp. 186–190
- *Supplementary readings:* Bryson 1996, Christensen & Carpiano 2014

*Assignment 4 due Nov 21 @ 3:00 pm*

*Final exam review (Nov 25 and 27)*

*Final exam for Units 1–12 (held during the formal exam period Dec 3 – 18)*