JSGS 807 – Statistics for Public Managers

UNIVERSITY OF REGINA CAMPUS	
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OFFICE HOURS:	Thursdays 8:30 pm to 9:30 pm or by appointment
OFFICE LOCATION:	Virtual – same virtual meeting details as lecture or as arranged via email
TERM:	Fall 2022 (Aug 31 to December 22)
ROOM:	Virtual – see course website for details
DATE AND TIME:	Synchronous online content Thursdays 5:30 to 8:30 with online material and exercises completed independently on your own schedule

LAND ACKNOWLEDGEMENT

The University of Saskatchewan campus of the Johnson Shoyama Graduate School of Public Policy is situated on Treaty 6 Territory and the Homeland of the Métis, while the University of Regina campus is situated on Treaty 4 Territory and the Homeland of the Métis. We pay our respect to the First Nation and Métis ancestors of this place and reaffirm our relationship with one another. As we engage in Remote Teaching and Learning, we would also like to recognize that some may be attending this course from other traditional Indigenous lands. I ask that you take a moment to make your own Land Acknowledgement to the peoples of those lands. In doing so, we are actively participating in reconciliation as we navigate our time in this course, learning and supporting each other.

INTELLECTUAL PROPERTY ACKNOWLEDGEMENT

The online modules used to guide major parts of this course are an amalgamation of great work by Dr. Justin Longo from the University of Regina and of Travis Reynolds, Alastair MacFadden, Lisa Jane de Gara, and Dan Florizone, all from the University of Saskatchewan. The online learning modules have also been updated with the support of the Distance Education Unit.

CALENDAR DESCRIPTION

Administrative decision making and policy development often require the analysis of quantitative data. This course will introduce students to descriptive and inferential statistics often used in policy environments so that they will be effective data users and interpreters. Students will be taught how to use and present descriptive statistics.

LEARNING OBJECTIVES

JSGS has developed a set of three competencies that all graduates will be able to demonstrate. The specific readings, assignments and activities in JSGS 807 will help you both acquire and demonstrate the ability to:

- Conduct basic statistical analyses;
- Understand existing and emerging methods to access and collect data;
- Understand common roles that do or support statistical analyses;
- Identify the relevant statistical tests to use to answer common questions;
- Critically assess and interpret statistical outputs;
- Accurately integrate statistical information into policy documents.

COURSE CONTENT AND APPROACH

This course aims to make people who have limited background in mathematics intelligent consumers of statistical analyses. The course will necessarily have to cover the methodology behind basic statistical analyses, but the focus will be more on helping students gain the skills needed to be strategic users of statistical information in policy settings.

This course employs various techniques to guide students through the content. These include:

1. Self-directed study through online modules related statistical analyses
   a. These modules are available on Rise through Canvas. Students must review the modules independently before the synchronous lecture that will cover them. These dates are outlined in course schedule below.
2. Synchronous online class time
   a. This will begin at the regularly scheduled course time. However, since there are self-directed components of this course, it will not always run the full three hours.
   b. This online time will include, as necessary, the following:
      i. Seminar: Approximately 30 minute student-led (as assigned) discussion of relevant readings as per the course schedule.
      ii. Instructor lecture on topic: This will review key content from the self-directed modules and introduce new content as necessary.
      iii. Lab instruction: This will demonstrate how to complete the required procedures for the lab exercises.
   c. Attendance and active participation in this synchronous component is mandatory. Students should inform the instructor if they cannot make a regularly scheduled class.
   d. Some parts, but not all, of this synchronous online time might be recorded and posted on the course website. Students should not rely on attendance and not the recordings to learn course content.
3. Independently completed lab assigned
   a. Students will work with datasets and spreadsheets to conduct basic analyses and will interpret the outputs of more complicated statistical procedures.

COURSE MATERIAL

1. Students are required to review the online course modules accessed on <mark>Rise through Canvas</mark>.

2. Students might be required to comprise a briefing note for some assignments or the take home final. To support your success with briefing notes, please refer to the JSGS Guide to Writing Briefing Notes:

    https://rise.articulate.com/share/coTHcUVvOZB68gCzEJQ2FYfWmxsrPTCd#/

    Also see this guide to creating a visual briefing note:

    https://rise.articulate.com/share/coTHcUVvOZB68gCzEJQ2FYfWmxsrPTCd#/

3. Students are also required to read the assigned course readings which mainly come from:

    Harvard Business Review (2018). *HBR Guide to Data Analytics Basics for Managers*. Le Vergne Harvard Business Review Press.

    This is a collection of short articles dealing with management perspectives on data analysis. This collection can be acquired affordably online in variety of formats at any of the following links, among others:

    https://store.hbr.org/product/hbr-guide-to-data-analytics-basics-for-managers/10185

    https://www.amazon.ca/Guide-Data-Analytics-Basics-Managers/dp/1633694283

    https://books.google.ca/books/about/HBR_Guide_to_Data_Analytics_Basics_for_M.html?id=QjEtDwAAQBAJ&redir_esc=y

    https://www.chapters.indigo.ca/en-ca/books/hbr-guide-to-data-analytics/9781633694286-item.html

4. Students will also require a full version of Microsoft Excel to complete assignments and part of the take home final. U of S students may find details about acquiring a student copy here: https://servicecatalogue.usask.ca/it/software-licenses-for-students.php. All students may acquire this via a monthly subscription of less than $10 per month here: https://www.microsoft.com/en-ca/microsoft-365/buy/microsoft-365. If you wish, this subscription can be cancelled after the course.

COURSE OUTLINE AND ASSIGNMENTS

Course Schedule

Week	Date	Topic	Seminar Articles	Online Module	Assignments	Due Dates
1	Sept 1	Introductions				
2	Sept 8	Datasets and Data Roles	HBR Chapter 1 – Keep Up with Your Quants HBR Chapter 2 – A Simple Exercise to Help You Think Like a Data Scientist HBR Appendix – Data Scientist: The Sexiest Job of the 21st Century	Module 1: Descriptive Statistics		
3	Sept 15	Data Collection (1) and Data Cleaning	HBR Chapter 3 – Do You Need all that Data HBR Chapter 4 – How to Ask Your Data Scientists for Data Analytics HBR Chapter 8 – Can Your Data Be Trusted? A Guide to Visual Briefing Notes	Module 8: Data Collection by Other Means: Sensors, Devices, Open Data and Big Data	Lab 1 Exercise 1	
4	Sept 22	Descriptive Statistics		Module 2: Application of Descriptive Statistics and Data Visualization	Lab 1, Exercise 2	

5	Sept 29	Data Access and Privacy		Module 12: Ethical Use of Statistics		
6	Oct 6	Metrics and Trends	HBR Chapter 6 – Know the Difference Between Your Data and Your Metrics	Module 9: Indices, Indicators, and Dashboards Module 10: Indices and Indicators, Models, Simulations, and Scneario Tools		
7	Oct 13	Data Visualization	HBR Chapter 17 – Data is Worthless if You Don't Communicate It HBR Chapter 18 – When Data Visualization Works – and When It Doesn't HBR Chapter 20 – How to Make Charts That Pop and Persuade Longo		Lab 1, Exercise 3	
8	Oct 20	Data Collection (2)		Module 7: Data Collection: Polling Surveys, and Social Listening	Lab 2 Exercise 1 Lab 2 Exercise 2	Lab 1
9	Oct 27	Inferential Statistics and Correlations	HBR Chapter 9 – A Predictive Analytics Primer	Module 3B: Basic Statistical Measures		

			HBR Chapter 10 – Understanding Regression Analysis	Module 4: Inferential Statistics		
10	Nov 3	Hypothesis Testing	HBR Chapter 5 – How to Design a Business Experiment HBR Chapter 7 – The Fundamentals of A/B Testing	Module 5: Inferential Statistics 2 and Working with Incomplete Data	Lab 3, Exercise 1	Lab 2
11	Nov 10	No Classes				
12	Nov 17	Nonparametric Tests	HBR Chapter 14 – Linear Thinking in a Nonlinear World		Lab 3, Exercise 2	
13	Nov 24	Predictions and Effect Sizes	HBR Chapter 11 – Can Machine Learning Solve Your Business Problem? HBR Chapter 13 – A Refresher on Statistical Significance HBR Chapter 20 – Why It's So Hard for Us to Communicate Uncertainty	Module 11: Probabilities and Predictive Analytics	Lab 3, Exercise 3	
14	Dec 8	Recap: Interpretation Keys and Pitfalls	HBR Chapter 11 – When to Act on a Correlation, and When Not To HBR Chapter 15 – Pitfalls of Data-Driven Decisions HBR Chapter 16 – Don't Let Your Analytics Cheat the Truth	Module 6: Data in Context	Take home final exam made available	Lab 3

			HBR Chapter 21 – Responding to Someone Who Challenges Your Data HBR Chapter 22 – Decisions Don't Start with Data				
15	Dec 15	Final Exam					Take home final exam

ASSIGNMENTS AND EVALUATION

Full details of each assignment will be release on the course website.

Assessment	Description	Percentage of Overall Grade	Due Date
Seminar leadership	Students will be assigned on of the Seminar Articles from the HBR resource. They will facilitate an overview and discussion of the article.	10%	Various as per assignment for individual student
Active participation in synchronous online course	Students are required to actively participate by contributing to the student-led seminars, asking relevant questions, and actively listening. The instructor will assign a participation mark at the end of the course.	5%	Throughout
Lab 1	Completion and submission of Lab 1, which consists of the 3 exercises referred in the course schedule.	20%	Oct 20
Lab 2	Completion and submission of Lab 2, which consists of the 2 exercises referred to in the course schedule	20%	Nov 3

| Lab 3 | Completion and submission of Lab 3, which consists of the 3 exercises referred to in the course schedule | 15% | Dec 8 |
| Take home final | Completion and submission of take home final exam | 30% | Dec 15 |

LATE ASSIGNMENTS

Late submissions of labs will only be accepted in pre-arranged circumstances with the instructor of in exceptional circumstances. A 10% penalty on the overall grade will be assessed for these instructor-approved late submissions.

Final exam extensions or new dates cannot be granted by the instructor. If there are exceptional and unforeseen circumstances that require an alternate date for submission of the final exam, the student and instructor will have to work with the appropriate administration to make arrangements.

JSGS GRADE DESCRIPTIONS

85+ excellent
A *superior performance* with consistent strong evidence of:
- a comprehensive, incisive grasp of the subject matter;
- an ability to make insightful critical evaluation of the material given;
- an exceptional capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently; and
- an excellent ability to apply theories to real-world problems and intersect with related disciplines.

80-85 very good
An *excellent performance* with strong evidence of:
- a comprehensive grasp of the subject matter;
- an ability to make sound critical evaluation of the material given;
- a very good capacity for original, creative and/or logical thinking;
- an excellent ability to organize, to analyze, to synthesize, to integrate ideas, and to express thoughts fluently; and
- a strong ability to apply theories to real-world problems and intersect with related disciplines.

75-80 good
A *good performance* with evidence of:
- a substantial knowledge of the subject matter;
- a good understanding of the relevant issues and a good familiarity with the relevant literature and techniques;
- some capacity for original, creative and/or logical thinking;

- a good ability to organize, to analyze, and to examine the subject material in a critical and constructive manner; and
- some ability to apply theories to real-world problems and intersect with related disciplines.

70-75 satisfactory

A *generally satisfactory and intellectually adequate performance* with evidence of:
- an acceptable basic grasp of the subject material;
- a fair understanding of the relevant issues;
- a general familiarity with the relevant literature and techniques;
- an ability to develop solutions to moderately difficult problems related to the subject material; and
- a moderate ability to examine the material in a critical and analytical manner.

ATTENDANCE AND PARTICIPATION EXPECTATIONS

Students are expected to attend all the synchronous sessions. If you are unable to attend (e.g., Internet problems), you must let the instructor know.

Active participation in class discussion is expected by all students**.**

HONOUR CODE

At the Johnson Shoyama Graduate School of Public Policy (JSGS), we believe honesty and integrity are fundamental in a community dedicated to learning, personal development, and a search for understanding. We revere these values and hold them essential in promoting personal responsibility, moral and intellectual leadership, and pride in ourselves and our University.

As JSGS students, we will represent ourselves truthfully, claim only work that is our own, and engage honestly in all academic assignments.

Since articulated standards and expectations can influence attitudes, and because each of us shares the responsibility for maintaining academic integrity (see below for details on academic integrity at the JSGS), we are committed to upholding the Academic Honor Code.

Academic Honour Pledge

As a member of the JSGS community, I pledge to live by and to support the letter and spirit of JSGS's Academic Honour Code.

ACADEMIC INTEGRITY AND CONDUCT

Understanding and following the principles of academic integrity and conduct is vital to your success in graduate school. Ensuring that your work is your own and reflects both your own ideas and those of others incorporated in your work is important: ensuring that you acknowledge the ideas, words, and phrases of others that you use is a vital part of the scholarly endeavour. The JSGS has developed an Honour Code (see above) that encapsulates these values.

If you have any questions at all about academic integrity in general or about specific issues, contact any faculty member and we can discuss your questions. For more information, please see:

Academic Integrity – https://www.uregina.ca/gradstudies/current-students/academic-integrity/index.html

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University of Regina Copyright information: https://www.uregina.ca/copyright/guidelines/fair-dealing.html

STUDENT RESOURCES

Remote learning information page for students. This resource engages students in learning about the skills associated with remote learning success.

https://www.uregina.ca/remote-learning/

RIGHTS & RESPONSIBILITIES OF GRADUATE STUDENTS

https://www.uregina.ca/gradstudies/current-students/Rights%20/index.html

STUDENTS WITH SPECIAL NEEDS

Students in this course who, because of a disability, may have a need for accommodations are encouraged to discuss this need with the instructor and to contact one of the following:

Centre for Student Accessibility – accessibility@uregina.ca or 306-585-4631.
https://www.uregina.ca/student/accessibility/index.html

STUDENTS EXPERIENCING STRESS

Counselling Services – http://www.uregina.ca/student/counselling/contact.html or call (306) 585-4491 between 8:30 a.m. to 4:30 p.m. Saskatchewan time Monday to Friday.

USE OF VIDEO AND RECORDING OF THE COURSE

Video conference sessions in this course, including your participation, *might* be recorded and made available only to students in the course for viewing via the course website. This is done, in part, to ensure that students unable to join the session (due to, for example, issues with their Internet connection) can view the session later. This will also provide students with the opportunity to review *some* of the key material discussed. Students should not record sessions and rely on the instructor to facilitate such recording. Students are not permitted to distribute the recordings (see below).

Please remember that course recordings belong to the instructor, the University, and/or others (like a guest lecturer) depending on the circumstance of each session, and are protected by copyright. Do not download, copy, or share recordings without the explicit permission of the instructor.

For questions about recording and use of sessions in which you have participated, including any concerns related to your privacy, please contact your instructor.

ADDITIONAL EVALUATION INFORMATION

More information on the Academic Courses Policy on course delivery, examinations and assessment of student learning can be found at: https://www.uregina.ca/student/registrar/resources-for-students/academic-calendars-and-schedule/undergraduate-calendar/assets/pdf/2019-2020/Academic-Regulations.pdf