Applied Research Methods & Statistics

Winter 2024

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Class Meetings: January 8 – March 11 6:00pm-9:00pm

Class Location: TBA

Course Description: Applied research methods & statistics examines statistical approaches from a practical viewpoint using R (RStudio), a powerful tool for statistical modeling. The course's aim is to introduce students to a variety of statistical research techniques as well as enhance their ability to generate, read, and interpret research findings. Ultimately the goal is for students to become better users and readers of research and workplace data. Our task is to learn how to analyze data sensibly and in context in order to enhance decision-making and organizational performance.

Using R (RStudio) we will be able to fit statistical models to data, assess the goodness of fit, display estimates, standard errors, and predicted values derived from models. The software also provides us with the means to define, manipulate, explore, tabulate, and sort data. The recommended textbooks provide programing scripts and datasets for practice and homework assignments.

"Learning R is not easy, but you will not regret investing the effort to master the basics."[1] (Crawley, 2015)

Learning objectives and student competencies:

1. Develop and achieve familiarity and competency with concepts and application of quantitative methods typically used in administrative, service, and policy arenas. This includes both statistical procedures and software application.
    a. Understand how to use these in research design.
    b. Know what questions to ask of data; the techniques to use to ask the "right" questions and how to interpret findings.
2. Develop facility with interpreting the use of these methods in research done by others; be able to understand when the methods are applied appropriately and what the results do and do not tell us.
3. Make meaning of research output.
4. Acquire proficiency with R.
5. Increase proficiency with other research methods including sampling, secondary data analysis, and statistical process control.

[1] R (RStudio) is a free software that is similar to SAS, software used by Washington State's agencies.

Required Readings

THERE ARE NOT REQUIRED TEXTS FOR THIS CLASS – SEE THE RECOMMENDED READINGS BELOW.

Even though there are no required texts that you must purchase, the use of any introductory statistics textbook will be beneficial. Feel free to use the library and check out any "introduction to statistics" textbook for this class. Any will do!!!

You will find resources for the weekly topics on canvas. Use the topics in the weekly schedule below to locate contents in the introductory statistics text of your choice!

Recommended Readings

Books:

Levine, D., Stephan, D., & Szabat, K. (2016). Statistics for Managers. **(THIS IS A RECOMMENDED READING NOT REQUIRED FOR SUCCESSFUL COMPLETION OF THE CLASS)**

Crawley, Michae J. 2015. *Statistics: an introduction using R*, 2nd edition. John Wiley & Sons, Ltd. (AVAILABLE AS A **FREE E-BOOK** THROUGH THE EVERGREEN STATE COLLEGE LIBRARY) **(THIS IS A RECOMMENDED READING NOT REQUIRED FOR SUCCESSFUL COMPLETION OF THE CLASS)**

Fox, John & Sanford Weisberg. 2011. *An R companion to applied regression*, 2nd edition. Sage Publications Inc. **(THIS IS A RECOMMENDED READING NOT REQUIRED FOR SUCCESSFUL COMPLETION OF THE CLASS)**

Miller, J. E. (2021). Making Sense of Numbers: Quantitative Reasoning for Social Research. SAGE Publications. **(THIS IS A RECOMMENDED READING NOT REQUIRED FOR SUCCESSFUL COMPLETION OF THE CLASS)**

*****Additional readings/resources will be posted on canvas*****

Winter 2024 schedule (Faculty may alter schedule and reading assignments)

DATE	TOPIC
Week 1 January 8	• Introduction, Fundamentals, and R (RStudio) • Dataframes, reading and manipulating data (exploring and transforming data)
Week 2 January 15	**Martin Luther King Day – NO CLASS**
Week 3 January 22	• Statistics refresher – basic vocabulary of statistics, data collection, types of variables • Organizing and visualizing variables
Week 4 January 29	• Central tendency and variance: mean, median, mode, variance, standard deviation
Week 5 February 5	• Probability & the normal distribution
Week 6 February 12	• Sampling, confidence levels, and hypothesis testing

Week 7 February 19	**Presidents' Day – NO CLASS**
Week 8 February 26	• Analysis of variance, covariance, and qualitative variables
Week 9 March 4	• Linear regression
Week 10 March 11	• Multiple regression

Student Assignments / Basis of Evaluation

1. **Participation** – Students must attend class having completed the readings and prepared to fully participate in class discussions and exercises. Students are expected to fully engage in discussions, presentations, exercises, and learn from them. If you are unable to attend class, please discuss this with the instructor to find a way to make up the work.
2. **Homework exercises** – Students will be required to complete and submit exercises from the assigned readings on weekly basis.
3. **Research paper/Final assignment** – Students will be required to write a research paper (research report). This assignment may be completed individually or in small groups (2-3 students). The project must include: (i) an abstract; (ii) introduction; (iii) literature review (hypotheses); (iv) methods section; (v) findings; (vi) discussion; and (vii) conclusion sections. **PLEASE NOTE**: the *research paper can be completed using the data (knowledge) from the cumulative weekly homework exercises*! You do not need to seek out a research topic, and conduct a literature review if you prefer not to. Throughout the course of the quarter you will gain the knowledge, skills, abilities, and data to write a comprehensive report.

Course Policies

Format: Unless otherwise noted, all written assignments should be typed, double spaced, 12 point font, and follow APA format and citation style. [APA Style http://www.apastyle.org/learn/index.aspx Purdue Writing & Grammar Guide http://owl.english.purdue.edu/] All written work will be of high quality, grammatically correct, clear and without spelling errors. Students may request resource writing assistance from faculty and/or the Graduate Writing Assistant.

Participation and attendance: Students are required to attend each synchronous online class meeting in its entirety. Participation includes focusing on class content, speaking in class and seminar, listening to others, taking notes, completing class interactive exercises, avoiding distractions, and listening to and dialoging with the guest speakers. If an absence is unavoidable, faculty should be notified prior to a class. After one absence (full synchronous online day), make-up work may be assigned at faculty discretion on case-by-case. Makeup work must be completed by the deadline assigned to ensure full receipt of course credit. After two absences (two synchronous online days) students may be denied full credit. Finally, if students do miss a class, they are expected to do the reading for that class meeting and turn in any assignments that were due that class date.

Late assignments: Turning in assignments late is unacceptable. However, if there is an unavoidable need to turn in an assignment late, the student should contact their seminar faculty no later than the original assignment due date to discuss options. Parameters are left to the discretion of the faculty on a

situation-by-situation basis. Late assignments must be completed by the revised due date to ensure full receipt of course credit.

Credit: Students will receive four graduate credits at the end of the course if all requirements have been satisfactorily completed. Students will be evaluated based upon their progress towards the learning objectives, assessed from classroom, seminar, and assignment performance. No incompletes will be awarded. Full loss of credit decisions will be made by the faculty. Full loss of credit for two terms of core may result in dismissal from the MPA program. Plagiarism (i.e., using other peoples' work as your own) may result in total loss of credit for the class and may result in dismissal from the MPA program. See the MPA Handbook and College statement on academic honesty for more information. Failing to meet course requirements (ex. not completing one or more assignments, completing one or more assignments late, or multiple absences) may constitute denial of total credit at the discretion of the faculty. Students at risk of losing credit will receive written notification prior to the end of the quarter.

Evaluation: A written self-evaluation and faculty evaluation are required each quarter for credit. All final evaluations are to be submitted via my.evergreen.edu. Evaluation conferences may occur in-person or over the phone.

Multiculturalism and diversity: Faculty and students will actively work towards contextually weaving multiculturalism and diversity throughout our learning as related to readings, lectures, seminar, and group projects. In a learning community students and faculty share the responsibility for the teaching and learning environment. Multiculturalism and diversity is to be understood as: aiming to promote constructive community discourse about issues of culture, power, and differences including but not limited to race, ethnicity, color, nationality, sex, gender, gender identity, gender expression, class, sexual orientation, age, religion, (dis)ability, and veteran status.

Technology use and learning styles: We all have different ways of acquiring new knowledge. Therefore, faculty will actively work towards providing information in multiple formats: tactile, auditory, visual, experiential, etc.

Reasonable accommodations will be provided for any student who qualifies for them through a working relationship with Access Services. To request academic accommodations due to a disability, please contact the office of Access Services for Students with Disabilities (867-6348 or 6364). If the student is already working with the office of Access Services the faculty should have received a letter clearly indicating the student has a disability that requires academic accommodations. If any student has a health condition or disability that may require accommodations in order to effectively participate in this class, please do the following: Contact faculty before class and Contact Access Services to receive a letter of accommodation. Information about a disability or health condition will be regarded as confidential. Please refer to TESC's Students with Disabilities Policy.

Conduct and conflict resolution: Discuss any problems involving others in the learning community directly with the individuals involved (so long as the concerned party feels safe doing so). Possessing respect for others is fundamental to an open, free, and educational dialogue. All students are expected to support and contribute to a well-functioning MPA classroom and learning community. Behavior that disrupts the learning community may be grounds for disciplinary action, including dismissal from the MPA program. All students will be held accountable for maintaining the highest of academic standards.

We will abide by the social contract: WAC 174-121-010 College philosophy.

We will abide by the student conduct code (including academic integrity and plagiarism): Chapter 174-123 WAC**,** Student Conduct Code & Grievance/Appeals Process.
We will abide by the non-discrimination policies and procedures at TESC.

Guest policy: Guests are welcome to visit our learning community during class time and seminar meetings with discretionary approval from course faculty in advance of the requested visit. It is the host student's responsibility to contact the faculty with details about the requested guest visit and await approval. Guests must abide by all social contract conduct code, and nondiscrimination policy guidelines as aforementioned in this syllabus.

Inclement weather: In the event of bad weather or emergencies students should check with for announcements of campus closures. Students can call the main campus line 867-6000 to get the latest news regarding a campus closure or delay. Faculty may decide to cancel a class meeting even if campus is open and we will send an all-class email prior to 3:00 pm the day of class. Students are responsible for checking email and ensuring viable transportation options are available to them.

Communicating: Email and Canvas are our primary means of communication. Students are responsible for checking their Evergreen email and Canvas regularly.