Advanced Research Methods



Course Reference Number (4): 30264 Spring Quarter: Mondays, 6–10pm 4 Credit Hours

Purce 7

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This syllabus is subject to revision. This version is valid only as of March 5, 2020. Check the class Canvas site for the most current information.

Course Description: Measurement and evaluation are foundational to the data and statistics used in public administration practice. This course explores applied statistical reasoning from a practical viewpoint using R, a powerful tool for statistical modeling. The course 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 data.

This is a course about developing applied skills in data analysis for public administration officials in order to enhance decisionmaking and organizational performance. Using R 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.

This class will include weekly skills assessments and hands-on workshops to reinforce learning concepts. While understanding these statistical concepts is critical, we will focus on applying these concepts to actual public administration data in a practical way.

NOTES ON READINGS:

All journal articles or web links will be posted to Canvas There is one book to purchase: Crawley (2015). We will also be using Huck (2011) and de Vries and Meys (2015), which are provided on Canvas. Crawley (2015) is also available on Open Reserve through the Evergreen Library.

Readings

Bryman, Alan and Duncan Cramer. 2004. Constructing Variables. In *Handbook of Data Analysis*, ed. Melissa Hardy and Alan Bryman. SAGE Publications pp. 17–34.

Crawley, Michael J. 2015. Statistics: An Introduction Using R. 2nd edition ed. Wiley.

de Vries, Andrie and Joris Meys. 2015. R for Dummies. John Wiley & Sons.

- Huck, Schuyler W. 2011. *Reading Statistics and Research*. Sixth ed. Boston: Pearson Education Inc.
- R Core Team. 2014. R: A Language and Environment for Statistical Computing. Vienna: R Foundation for Statistical Computing.

Course Policies:

• Evaluations

- Students will be evaluated based on regular attendance and reading, timely submission of thoughtful writing projects, and active engagement with their classmates.
- Students are required to submit a self-evaluation and a faculty evaluation. You can submit these evaluations via the College's online evaluation system at my.evergreen.edu.
 Students are not required to submit self-evaluations to their transcripts. An evaluation conference is optional.
- Assignments
 - No late assignments will be accepted except under extraordinary circumstances. Please contact me as soon as possible if this occurs.
- Attendance and Absences
 - Regular attendance is expected. You are allowed to miss 1 class (4 hours of instruction time) during the quarter without penalty.
 - Students are responsible for all missed work, regardless of the reason for absence. It is also the absentee's responsibility to get all missing notes or materials.

Academic Honesty Policy Summary:

From the TESC Statement on Academic Honesty: "Academic honesty is essential in a learning community. It makes coherent discourse possible and is a necessary condition for all sharing, dialogue and evaluation. All forms of academic dishonesty, including cheating, fabricating, facilitating academic dishonesty and plagiarism, are violations of the Social Contract. Cheating is defined as using or attempting to use unauthorized materials, information or study aids in any academic exercise. Fabrication is defined as faking data, footnotes or other evidence. Plagiarism is defined as representing the works or ideas of another as one's own in any academic exercise. It includes, but is not limited to, copying materials directly, failure to cite sources of arguments and data, and failure to explicitly acknowledge joint work or authorship of assignments." TESC Statement on Academic Honesty http://www.evergreen.edu/advising/academic-honesty

TESC The social contract - College philosophy http://apps.leg.wa.gov/wac/default.aspx?cite=174-121-010

TESC Student Conduct Code http://apps.leg.wa.gov/wac/default.aspx?cite=174-123

Authorship

The student must clearly establish authorship of a work. Referenced work must be clearly documented, cited, and attributed, regardless of media or distribution. Even in the case of work licensed as public domain or Copyleft, (See: http://creativecommons.org/) the student must provide attribution of that work in order to uphold the standards of intent and authorship.

Laptop and Electronic Device Policy

Students are responsible for bringing their laptops to every class session. As per Assignment 1, students must have RStudio installed on their laptop computers before the beginning of the first class, as it will be integral to most exercises. Instructions and tutorials for RStudio are posted to the class Canvas site.

Holidays for Reasons of Faith or Conscience:

Please inform me in writing within the first two weeks of class if you will miss specific class sessions because of holidays of faith or conscience, or for an organized activity conducted as part of a religious denomination, church, or organization. If you let me know within that time frame, I will offer you reasonable accommodations, and the absence(s) will be excused. For more information, please refer to the Evergreen policy at: https://www.evergreen.edu/policy/religious-observance

Weekly Assignments (See Course Schedule for Due Dates)

Weekly Assignments: Statistical Assessments

Due every week by Friday night.

Every week between classes, you will be assigned a statistical assessment test to take at home, that is due every week *the Friday before class*. Your performance on these assessment tests are not included in your evaluation, although you are required to complete them every week. These assessments will cover the topics of the next week, and will be the basis for in-class exercises with hands-on learning in R.

Weekly Assignments: Homework

Due every week by Monday night.

Every week, you will have take-home homework to develop your own R code and practice concepts from the *prior* week's class.

Assignment 1: Install RStudio

Bring Your Laptop to Class with RStudio installed: This could take between 1 and 3 hours to figure out, so plan ahead!

Throughout this class, we will be using R (R Core Team, 2014) and we need to hit the ground running. As with many aspects of programming, installing RStudio (a graphical user interface for R) may be challenging and a hassle. You are expected to search the web, check help forums, and do everything possible to install RStudio yourself before requesting assistance. This is excellent practice for the endless frustration that comes with programming generally, and R specifically, and the sooner you exercise searching for help on your own, the more well-equipped you will be to handle the challenges of the class.

Help resources for installing RStudio are posted to Canvas.

Final Assignment: Final Paper and Presentation

The content and structure of the final paper and presentation will be posted to Canvas before the first day of class.

Tentative Course Outline:

The weekly coverage might change as it depends on the progress of the class. However, you must keep up with the reading assignments.

Session	Content
March 30	 Module 2: Introduction to R and Course Overview Readings: 1. Crawley (2015, Chapter 1) 2. Bryman and Cramer (2004) 3. de Vries and Meys (2015, Chapters 1 & 2) Assignments Due: Assignment 1
April 6	No Class
April 13	 Module 2: Data in R Readings: 1. Crawley (2015, Chapter 2) 2. (Huck, 2011, Chapter 2) 3. de Vries and Meys (2015, Chapters 3 & 4)
April 20	Module 3: Exploring Data in R Readings: 1. (Huck, 2011, Chapter 3)
April 27	Module 4: Measures of Central Tendency Readings: 1. Crawley (2015, Chapters 3, 4, 5 & 6) 2. (Huck, 2011, Chapter 5)
May 4	Module 5: Introduction to Linear Regression Readings: 1. Crawley (2015, Chapter 7) 2. (Huck, 2011, Chapter 6)
May 11	Module 6: ANOVA and Qualitative Variables Readings: 1. Crawley (2015, Chapters 8 & 9) 2. (Huck, 2011, Chapter 11)

May 18	Module 7: Introduction to Multiple Regression Readings: 1. Crawley (2015, Chapters 10 & 11) 2.
May 25	Module 8: Multiple Regression Readings: 1. (Huck, 2011, Chapter 16)
June 1	Module 9: Class Wrap-Up Readings: • None. Assignments Due: • Final Assignment: Paper and Presentation