STAT 614 STATISTICAL METHODS SECTION 4 **SYLLABUS**  FALL 2020

Instructor J. Dickens, PhD jdickens@american.edu

ONLINE Wednesdays 5:30pm – 8:00pm (Blackboard Collaborate)

Office Hours: Mondays 9am -- 11am Tuesdays 6pm – 8pm Fridays 4pm -- 6pm (you can also email me for help if you cannot make office hours)

Required Materials

Laptop or Desktop computer (High Speed Internet)

Textbook: Statistical Methods for the Social Sciences 5th edition, Agresti and Finlay

There will be occasional readings from other sources such as journal articles and content from other textbooks. Supplemental material will also be posted on blackboard; links will be given for quick and direct online access.

Course Content and Learning Outcomes

STAT 614 is an introduction to statistical methodology that emphasizes working with data and communicating statistical ideas. The course topics include randomized experiments, observational studies, tests of significance, confidence intervals, two-sample t tests, simple linear regression, multiple regression, analysis of variance, nonparametric methods , and more advanced topics as time permits.

The statistical language R will be the primary computing language to demonstrate and apply various data processing techniques. No previous knowledge of R is required; attributes and characteristics of R that we will need and use will be demonstrated and taught in class. **This is not a full R programming course.** Only the elements of R needed for statistical work in this class will be featured. We will also use other statistical software packages such as Excel and Statcrunch.

Provided below are the download links for R and Rstudio. Download both and remember to download R before you download Rstudio.

Download for R cran.r-project.org

Download for Rstudio rstudio.com/products/rstudio/download/#download

Learning Outcomes

A major focus for this course involves the ideas behind, and the methods for drawing conclusions about a population form a sample. At the end of this course you will be able to:

* Identify the major concepts related to statistical reasoning and to statistical inferences for drawing such conclusions.
* Recognize how these concepts are used in experiments and observational studies across many disciplines.
* Implement the covered methods by yourself in statistical analyses.

In particular, you will be able to identify the appropriate model or models for a given analysis, write the model in the correct notation, implement the model in a software package on a given set of data, interpret the output in the context of the study, diagnose model deficiencies, and suggest improvements to the model if necessary.

Work will be a balance between understanding the concepts underlying a method, implementation of the method, and interpretation of the results.

Class Structure

This class will be a blend of lecture, class discussion and labs. Become involved during class and please do not hesitate to ask questions whenever something is unclear to you. You are expected to attend online classes, for regular attendance contributes greatly to your performance in this course. Online sessions, however will be recorded so that students can have access to missed class sessions due to an emergency or for review and follow up regarding the material covered in class.

All students will be responsible for accessing and using important class related documents and assignments that will be emailed or posted on blackboard.

Grading

We will have regular in-class assignments, homework, semester exams and a Final exam. Late assignments are accepted only in the case of an extreme emergency. **The lowest homework score will be dropped at the end of the semester.**

Graded items and attached weights are given below;

Exam 1 15% Exam 2 15% Exam 3 15% Final Exam 20%

Homework 25% Classwork 10% (Anticipate weekly homework assignments; some of the exams will be take home)

Grading Scale:

100 – 95 A 88 – 85 B+ 79 – 75 C+ 69 – 55 D

94 – 89 A- 84 – 80 B 74 – 70 C 54 – 0 F

Topical Coverage in the textbook and Pacing

Week 1 / Introduction to R and Chapter 1 (Introduction to Statistical Methodology, Descriptive and Inferential Statistics)

Week 2 / Chapter 2 (Sampling and Measurement)

Week 3 / Chapter 3 (Descriptive Statistics)

Week 4 / Chapter 4 (Probability Distributions)

Week 5 / Chapter 5 (Statistical Inference; Confidence Intervals)

Week 6 / Chapter 6 (Statistical Inference; Significance Tests)

Week 7 / Chapter 7 (Comparing Two Groups)

Week 8 / Chapter 8 (Contingency Tables Chi-Square Test)

Week 9 / Chapter 9 ( Linear Regression)

Week 10 / Chapter 10 (Multivariate Relationships ,Multiple Regression)

Week 11 / Chapters 10 and 11 (Multiple Regression)

Week 12 / Chapter 12 (One Way ANOVA)

Week 13 / Chapters 12 and 13 (Two Way ANOVA, ANOVA and Regression)

Week 14 / Chapters 14 and 15 (Model Building and Logistic Regression0

Week 15 / Review and Final Exam Preparation

**ASSISTANCE/SUPPORT**: Before receiving any assistance please make sure that you have read through the class materials, and that you have made a fair attempt at the problem. You have many excellent resources to use for assistance outside of class:

• Always feel welcome to come visit me during my office hours. Office hours are often busy so please come prepared with specific questions. If you are having ANY trouble with the class, please come see me about it as soon as possible. Do not wait until it is too late.

• I set aside a few hours each week specifically for individual meetings with students. If you need extra help, please email me to set up a time.

• Use your peers! Feel free to work with your classmates on assignments. Just make sure that you write down the solutions in your own words, just as you do in class.

• You are also encouraged to ask me questions online via email. If you are having problems with your code, be sure to attach your code to your email. Additional support services are available on campus that may assist you in successfully completing the course requirements. Details provided by each support service’s office are provided below.

• **The Academic Support and Access Center** (x3360, MGC 243) supports the academic development and educational goals of all AU students while also providing support to students with disabilities. We offer workshops on topics of interest to all students such as time management, note taking, critical thinking, memory skills, and test taking. Additional support includes free private and group tutoring in many subjects, supplemental instruction, The Math Lab and The Writing Lab.

• **The Counseling Center** (x3500, MGC 214) is here to help students make the most of their university experience, both personally and academically. We offer individual and group counseling, urgent care, self-help resources, referrals to private care, as well as programming to help you gain the skills and insight needed to overcome adversity and thrive while you are in college. Contact the Counseling Center to make an appointment in person or by telephone, or visit the Counseling Center page on the AU website for additional information.

**• Center for Diversity & Inclusion** (X3651, MGC 201) is dedicated to enhancing LGBTQ, Multicultural, First Generation, and Women's experiences on campus and to advance AU's commitment to respecting & valuing diversity by serving as a resource and liaison to students, staff, and faculty on issues of equity through education, outreach, and advocacy.

• **OASIS: The Office of Advocacy Services for Interpersonal and Sexual Violence** (X7070) provides free and confidential advocacy services for anyone in the campus community who is impacted by sexual violence (sexual assault, dating or domestic violence, and stalking).

A Few Additional Notes

• I expect you to be courteous to me and your fellow classmates both inside and outside of the classroom. This generally just involves a bit of common sense. Cell phones need to be silenced and put away during class. Laptops should be out during class time for use only on class activities. Please save texting, typing/sending emails, checking Facebook, etc. for outside of class time. Any correspondence pertaining to the course needs to be handled in a respectful manner.

• Please let me know during the first week of classes if you have any special needs that require accommodations.

• A grade of incomplete will only be given under extreme circumstances and will not be granted to any student who is failing.

• In the event of an emergency, refer to the AU information line at (202) 885-1100 and the AU Web site (http://www.american.edu/emergency) for general university-wide information. In the event that class is cancelled for ANY reason I will communicate with you via email and Blackboard to let you know what work you will be responsible for.

• Please be sure that you are familiar with AU’s Academic Integrity Code, as I am required to report any cases of academic dishonesty to the dean of CAS. For your review: <http://www.american.edu/academics/integrity/>.

Important course dates:

Exam 1 September 23rd, 2020 (In Class)

Exam 2 October 21rst, 2020 (Take Home)

Exam 3 November 23rd, 2020 (Take Home)

Final Exam December 9th, 2020 (Take Home)

On the following pages I have attached the official Fall academic calendar that you may find to be informative and useful.

**[Fall Semester 2020](https://www.american.edu/provost/registrar/academiccalendar/academic-calendar-2020-2021.cfm" \l "collapse-4968130)**

| 2020 Fall Semester Calendar | | |
| --- | --- | --- |
| **Date** | **Day** | **Event** |
| 8/1/2020 | Sat | Payment due for fall classes |
| 8/18/2020 - 8/30/2020 | Tue | All-American Welcome (Virtual events will be hosted the week before classes start and through the first week of classes) |
| *8/21/2020* | *Fri* | *WCL: Fall classes begin* |
| 8/21/2020 | Fri | Last day to register for fall without a late fee |
| 8/24/2020 | Mon | Fall classes begin |
| 8/24/2020 | Mon | Late registration (with $100 fee) begins |
| 8/28/2020 | Fri | Late registration for fall ends |
| 9/4/2020 | Fri | Last day to add a fall course, internship, Independent Reading or Research, or Community Service-Learning project |
| 9/4/2020 | Fri | Last day to withdraw from a fall course for a 100% refund and without a "W" recorded |
| 9/7/2020 | Mon | Labor Day; no classes, university offices closed |
| 9/14/2020 | Mon | Last day to withdraw from a fall course for a 50% refund |
| 9/21/2020 | Mon | Last day to withdraw from a fall course for a 25% refund (no refunds after this date) |
| 9/28/2020 | Mon | Academic alerts due in Registrar's Office |
| 10/5/2020 | Mon | Schedule of Classes for Spring published |
| 10/9/2020 | Fri | Fall Break; no classes, university offices open |
| 10/9/2020 - 10/11/2020 | Fri-Sun | Fall Skills and Career Development Days |
| 10/26/2020 | Mon | Spring priority registration for graduate students begins |
| 10/30/2020 | Fri | Last day to withdraw from a fall course or change a grade option (end of the 10th week) |
| 10/31/2020 | Sat | Last day to apply for fall graduation |
| 11/2/2020 | Mon | Spring priority registration for undergraduate students begins. |
| 11/6/2020 | Fri | Theses and dissertations due in deans’ offices for fall degree candidates |
| 11/24/2020 | Tue | Tuesday classes cancelled; Friday classes meet |
| 11/25/2020 - 11/29/2020 | Wed | Thanksgiving holiday; no classes; university offices closed Thursday and Friday |
| *12/2/2020* | *Wed* | *WCL: Fall classes end* |
| 12/4/2020 | Fri | Fall classes end. Theses and dissertations due in Registrar's Office for fall degree candidates |
| 12/5/2020 - 12/6/2020 | Sat-Sun | Fall Study Days |
| 12/7/2020 - 12/12/2020 | Mon-Sat | Fall final examinations (conducted remotely) |
| *12/8/2020* | *Tue* | *WCL: Examinations begin* |
| 12/13/2020 | Sun | Fall Commencement Ceremony for August and December graduates |
| 12/17/2020 | Thu | All full-term fall classes final grades due |
| *12/19/2020* | *Sat* | *WCL: Examinations end* |
| *12/21/2020* | *Mon* | *WCL: Official Degree Award Date (date that appears on December diplomas; no event associated with this date)* |
| 12/24/2020 - 1/3/2021 | Thu-Sun | Winter break; university offices closed |
| 12/31/2020 | Thu | Official Degree Award Date (date that appears on December diplomas; no event associated with this date) |

Lets have a great semester !!