

**Advanced Academic Programs
Zanvyl Krieger School of Arts and Sciences
Johns Hopkins University
AS.470.673 – Data Visualization
Spring 2021**

Instructor Information

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Course Description

This course instructs students in various visualization techniques and software, including R, Tableau, and vector graphics. Students will learn how to: (1) ask interesting questions about politics, (2) identify data that can be used to answer those questions, (3) collect, clean and document the data, (4) explore and analyze the data with statistical and graphical techniques, (5) create compelling, informative and accurate visualizations and (6) present these visualizations to educated audiences.

This course presumes familiarity with R and RStudio, which all students in this class should have already obtained by completing 470.681, Statistics and Political Analysis. I also assume that you are ready and willing to go out and explore the exciting world of open-source graphics.

Course Goals & Learning Objectives

By the end of this course, you will be able to:

- Develop social science research questions that can be addressed using statistical graphics
- Import data into Tableau and use Tableau to create visualizations such as scatterplots, bar charts, line charts, histograms, density plots, pie charts plots, choropleths, and more
- Import data and prepare data for visualization using the tidyverse packages in R
- Install and use visualization tools in the ggplot family of tools in R to create figures like bar charts, line charts, histograms, density plots, pie charts, and choropleths, and more
- Refine the graphical design elements of figures using a vector graphics editor, including features like titles, axes labels, colors, explanatory notes, and more
- Create interactive visualizations and dashboards that can be published online using tools like shinyapps.io and Tableau Online
- Develop a keen eye for critiquing data visualizations based on principles of human visual processing

Course Materials

Textbooks

The following texts are required for this course:

- *Data Visualization*, Kieran Healy, 2019, Princeton University Press, ISBN-10: 0691181624
- *Visual Analytics with Tableau*, Alexander Loth, 2019, Wiley, ISBN-10: 1119560209
 - This text is available in a free e-version through the JHU library.

Additional readings will be made available on Blackboard.

Specific Technology Requirements & Skills

Learning online requires some basic knowledge of computer technology. At a minimum, you need to be able to:

- Navigate in and use Blackboard; the Blackboard Student Orientation course on your “My Institution” page
- Create and save MS Word documents; review [MS Word training and tutorials](#) for PC users (all versions); [Word Help](#) for Mac users
- Find basic resources on the Internet
- Create and organize files & folders on your computer
- Send, receive, and manage email

In addition, this class uses R, RStudio, Tableau and Inkscape. Any Mac or Windows PC will support these programs. Instructions for installation will be provided throughout the semester.

To be ready for the R programming in this course, you should have completed 470.681, Probability and Statistics prior to this course.

Tableau and Inkscape are relatively straightforward point-and-click programs. If you have good Microsoft Office skills, these should be largely transferrable to these programs.

Course Protocols

Course Weeks

This course follows a weekly schedule. Each week begins on a Monday and ends on the following Sunday at 11:59pm. Please review the course syllabus thoroughly to learn about specific course outcomes and requirements. The instructor will circulate course announcements with reminders and checklists as needed.

The Spring 2021 semester is unusual because JHU has eliminated the normal spring break. As a result, the course is functionally 16 weeks long. The additional week will be added as a work week.

Course Communication

You are expected to log into Blackboard regularly throughout the week - a daily check-in is recommended. It is your responsibility to read all announcements and to keep up with course activities.

Changes to the course will be posted in the Announcements section of your course. Please check announcements every time that you log into your online course.

When you have a question about an assignment or a question about the course, please contact your instructor.

Email Etiquette

When sending emails, please (1) include the title of the course in the subject field, (2) keep messages concise to the extent possible, and (3) sign your full name (the sender's email is not always obvious).

All email messages will be sent to you via your JHU email account, so you should be in the habit of checking that account every day or you should ensure that your JHU email account forwards messages to another account of your choice.

If you do not receive a response to an email within 24-48 hours, please send a follow up email or text message.

Online Etiquette

In all online communication, it is important to follow proper rules of online etiquette - communicating with others in a proper and respectful way. Abusive or biased behavior will not be tolerated.

Assignments

Grading Policy

The course is out of 100 total points.

The course uses the following scale:

A	94% and above
A-	90% and less than 94%
B+	88% and less than 90%
B	84% and less than 88%
B-	80% and less than 84%
C	70% and less than 80%
F	0% and less than 70%

This course will follow the [Advanced Academic Programs Grading Policies](#).

Assignment Submission

All assignments will be submitted through Blackboard. Because assignment types vary, submission directions will be included for each assignment.

Late Policy

It is your responsibility to keep up with the course schedule. If you need to turn in an assignment late, please email the instructor before the due date saying you will need additional time, then email again when you submit your late work. The instructor reserves the right to lower your grade on an assignment to a B if an assignment is more than one week late without prior communication or prompt explanation.

Assignment Feedback

The instructor will aim to return assignments to you within 7 days following the due date. You will receive feedback in the My Grades area of the course which can be accessed via the navigation menu.

Time Management Expectations

Please seek help before becoming frustrated and spending a significant amount of time to resolve an issue. A general rule is that if you are stuck on an assignment and not making progress for more than two hours, seek assistance.

Course Schedule and Assignments

The Spring 2021 semester is unusual because JHU has eliminated the normal spring break. As a result, the course is functionally 16 weeks long. The additional week will be added as a work week.

	Topic and Assignment	Points
Week 1	Course Introduction Visualization Critique	5
Week 2	Tableau Week 1 Tableau Assignment I	5
Week 3	Tableau Week 2 No assignment	
Week 4	Tableau Week 3 and Portfolio Proposals Portfolio Proposals Tableau Dashboard	5 5
Week 5	R Review and tidyverse Intro RMarkdown Report	5
Week 6	More tidyverse and ggplot Intro ggplot I	5

Week 7	Graphics Tweaks ggplot II	5
Week 8	More Figure Types ggplot III	5
Week 9	Spatial Figures Original Viz or Replication	5
Week 10	Shiny Shiny Application	5
Week 11	Plotly and Dashboards in R No assignment - work on portfolios	
Week 12	Portfolios Work Week and Optional Material No assignment – work on portfolios	
Week 13	Visualization Critiques and Work Week Visualization Critique II	5
Week 14	Portfolio Presentations Presentations	15
Week 15	Final Portfolio Work Week Respond to your colleagues' presentations	
Week 16	Final Portfolio Work Week Submit final portfolio	30
	Total Points	100

University Policies

General

This course adheres to all University policies described in the academic catalog. Please pay close attention to the following policies:

Students with Disabilities

Johns Hopkins University is committed to providing reasonable and appropriate accommodations to students with disabilities. Students with documented disabilities should contact the coordinator listed on the [Disability Accommodations](#) page. Further information and a link to the Student Request for Accommodation form can also be found on the [Disability Accommodations](#) page.

Ethics & Plagiarism

The strength of the university depends on academic and personal integrity. In this course, you must be honest and truthful. Ethical violations include cheating on exams, plagiarism, reuse of assignments, improper use of the Internet and electronic devices, unauthorized collaboration, alteration of graded assignments, forgery and falsification, lying, facilitating academic dishonesty, and unfair competition. Report any violations you witness to the instructor. Read and adhere to JHU's [Notice on Plagiarism](#).

Dropping the Course

You are responsible for understanding the university's policies and procedures regarding withdrawing from courses found in the current catalog. You should be aware of the current deadlines according to the [Academic Calendar](#).

Getting Help

You have a variety of methods to get help on Blackboard. Please consult the resource listed in the "Blackboard Help" link for important information. **If you encounter technical difficulty in completing or submitting any online assessment, please immediately contact the designated help desk listed on the [AAP online support page](#).** Also, contact your instructor at the email address listed in the syllabus.

Copyright Policy

All course materials are the property of JHU and are to be used for the student's individual academic purpose only. Any dissemination, copying, reproducing, modification, displaying, or transmitting of any course material content for any other purpose is prohibited, will be considered misconduct under the [JHU Copyright Compliance Policy](#), and may be cause for disciplinary action. In addition, encouraging academic dishonesty or cheating by distributing information about course materials or assignments which would give an unfair advantage to others may violate AAP's [Code of Conduct](#) and the University's [Student Conduct Code](#).

Specifically, recordings, course materials, and lecture notes may not be exchanged or distributed for commercial purposes, for compensation, or for any purpose other than use by students enrolled in the class. Other distributions of such materials by students may be deemed to violate the above University policies and be subject to disciplinary action.

Code of Conduct

To better support all students, the Johns Hopkins University non-academic Student Conduct Code has been integrated and updated to include all divisions of the University. In addition, it is important to note that all AAP students are still accountable for the Code of Conduct for Advanced Academic Programs.

Title IX

Confidentiality and Mandatory Reporting

As an instructor, one of my responsibilities is to help create a safe and inclusive learning environment on our campus. I also have mandatory reporting responsibilities related to my role as a Responsible Employee under the Sexual Misconduct Policy & Procedures (which prohibits sexual harassment, sexual assault, relationship violence and stalking), as well as the General Anti-Harassment Policy (which prohibits all types of protected status based discrimination and harassment). It is my goal that you feel able to share information related to your life experiences in classroom discussions, in your written work, and in our one-on-one meetings. I will seek to keep information you share private to the greatest extent possible. However, I am required to share information that I learn of regarding sexual misconduct, as well as protected status based harassment and discrimination, with the Office of Institutional Equity (OIE). For a list of individuals/offices who can speak with you confidentially, please see Appendix B of the JHU Sexual Misconduct Policies and Laws.

For more information on both policies mentioned above, please see: JHU Relevant Policies, Codes, Statements and Principles. Please also note that certain faculty and other University community members also have a duty as a designated Campus Safety Authority under the Clery Act to notify campus security of certain crimes, as well as a duty under State law and University policy to report suspected child abuse and/or neglect.