Data Visualisation for Data Scientist | POP77154

Year	1
ECTS Credits	5
Contact Hours	TBC
Pre-requisite	Nil
Semester	2
Module Leader & Lecturer	Dr Jeffrey Ziegler
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Module Outline

Description:
This course builds foundational skills in data visualisation, emphasising both conceptual principles and practical techniques. We begin by establishing core competencies in R, tidy data workflows, as well as the essentials of graphic designs and data mapping. As the module progresses, we focus on representing amount and proportions, visualising uncertainty and effectively communicating relationships and comparisons. Special attention is given to the use of themes and annotations to enhance interpretability. The final weeks explore strategies for visualising complex data structures; including spatial, temporal, and textual information. Much of the learning will occur outside the classroom through hands-on practice with statistical software, critical analysis of existing visualisations and iterative project work.

Module Outline:
The following is an anticipated schedule of course topics. The plan is to cover a new topic each week, but we will go as fast as needed to make sure that everyone is understanding the material. Check the course website to see what we will be covering in the upcoming lectures. We also have a Google Calendar that is posted on the course website with the up-to-date information on problem sets, office hours, lectures and exams. Note that the dates below references the Monday of every week (i.e. week 1 starts on Monday January 19):

- Week 1: Intro & Foundation (R, tidy details, graphic design, mapping data)
- Week 2: Amounts & proportions, uncertainty
- Week 3: Relationships, comparisons
- Week 4: Themes and annotations
- Week 5: Visualising space, time and text

Office Hours:
I will hold office hours for individual 15-min meetings, please sign up! If you cannot attend regular office hours, please contact me via email.

Class Materials:

All materials presented in class, and the readings used to prepare for this course, will be made available on the course website.

Class Structure:
I want our class to thrive no matter how we meet or your individual methods of participating in class. I cannot guarantee an identical experience for each student. But, my goal is that all students receive a high-quality experience to the extent possible, and that all students are treated equitably and consistently.
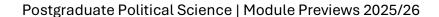
To ensure this, communication is important. I commit to responding to emails within 48 hours of receipt, and my intention is to respond faster than the most of the time. I will likely be slower on weekends. Likewise, if your situation changes regarding health, housing, or in any other aspect with regard to your ability to participate in class, please contact me and the appropriate student suport organisation as soon as feasible. It is easier for me to address your needs if I know about them. This does not mean I can successfully respond to every request, but I want to emphasise that I aim for you to succeed in life, not just this course.
This semester, some students might be sick, and if you are sick, understand that I will be flexible. Please make sure to email me so that we can discuss your individual circumstances. Otherwise, it is expected that you prepare for class and participate in office hours. Attendance directly and indirectly impacts your final grade. If you do attend meetings, please arrive on time; we will start promptly.

The lectures will provide you with core concepts and theoretical foundations of regression analysis in the social sciences. Lectures will be supported by a PowerPoint presentation. I will post a handout of the shortened, student version of the lecture on the course website under the "Slides" tab. You may want to use this brief outline to follow the lecture and take additional notes.

If class is moved online for an unexpected reason, all class sessions on Zoom will be recorded for students to refer back. The content presented through video conferencing will be posted on the course website for the sole purpose of educating the students enrolled in the course. The release of such information (including but not limited to directly sharing, screen capturing or recording content) is strictly prohibited, unless the instructor states otherwise. Doing so without the permission of the instructor will be considered an Honor Code violation.

Students who participate with their camera engaged or utilise a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute in class and participate orally are agreeing to have their

voices recorded. Please read the Rules of Zoom engagement for further advice on participating in our Zoom class sessions.

Student with Disabilities:
Students with disabilities enrolled in this course who may need disability-related classroom accommodations are encouraged to make an appointment to speak with me within the first week of the semester. All conversations will remain confidential. If you have a disability-related need for reasonable academic adjustments in this course, you are required to provide the instructor with an accommodation notification letter from the Office of Disability Services. If you need immediate accommodations or physical access, please arrange to meet with me as soon as your accommodation has been finalised.

Religious Observance:
Some students may wish to take part in religious observances that occur during the semester. If you have a religious observance that conflicts with your participation in the course, please talk to me within the first week of the semester to discuss accommodations.

Physical Health:
Though we are all minimising our contact with others, at the very first sign of not feeling well, stay at home and reach out for a health consultation. Please consult the campus FAQ for how to get a health consultation.

Mental Health:
Completing a MSc degree can be a difficult time. Please reach out to me with any concern, and know that Mental Health Services' professional staff members work with students to resolve personal and interpersonal difficulties, many of which can affect the academic experience. These include conflicts with or worry about friends or family, concerns about eating or drinking patterns, and feelings of anxiety and depression. Your health is a critical part of your success in life, not just your course work.

Assessment

Requirements:
Aside from the baseline requirements – class attendance, punctuality, and reading ahead in preparation for class – you are required to work on 4 problem sets associated with tutorials. The average of your top 3 problem sets accounts for 50% of your course grade. We will distribute problem sets every week, and I will expect to receive electronic copies of your assignments via GitHub.

You will turn in a project at the end of the module. Each of these counts for 50% of your grade.

Late assignments will not be accepted. Given that assignments should be turned in at regularly scheduled dates and given that midterm exam and replication also have a date fixed known well in advance, I will not allow incompletes in this class.

Absences, Late Work, and Appeals:
Late work will not be accepted without prior permission, and students who miss assignments will receive a score of 0 absent extraordinary circumstances. With that said, please consult me as soon as possible if there is an event that hinders your ability to participate in the class.

Appeals made on the validity of grading or assignment questions have to be made within five working days after publication of the results. The appeal has to be submitted with the original assignment. The appeal must explain in detail why an error has been made, and provide supporting evidence. If an assignment is regraded due to a successful appeal, this may result in a better grade, a lower grade or no grade change. Insufficient grounds for an appeal include: a student missed a lecture that covered relevant material, a student does not feel well but decided to complete the assignment anyway, a student did not understand the material, a student says that she/he wanted to give the correct answer but made a typographical error, a student would like additional consideration to receive a better letter grade.

Recommended Reading List
I will provide a list of interesting and pertinent books that will be used during the course. You need to consult them occasionally, but you **do not need to purchase them.** I will provide the assigned readings in PDF format on the course website.