

Term Project–Guidelines

STAT 7200–Multivariate Statistics

The main objective of the term project is to **explore the current literature** in multivariate analysis by producing a **critical summary of a recent research article**. Secondary objectives include:

- Practice your communication skills (both oral and written).
- Practice your critical thinking skills.
- Foster curiosity.

This project is to be completed individually. You will be assessed on both a short in-class presentation of your results, as well as a written report.

Finding a research article

The first step is to find an interesting article. The scope of acceptable articles is quite large: it needs to have been published in the last 20 years (i.e. no earlier than 2000), and it can have any combination of theoretical, computational, methodological or even applied results (of course, there still needs to be strong statistical content).

The main journal in the field of multivariate statistics is the *Journal of Multivariate Analysis*. As can be read on their website, this journal is the “central venue for the publication of new, relevant methodology and particularly innovative applications pertaining to the analysis and interpretation of multidimensional data.”

Of course, since most data is multivariate, the main journals in statistics also publish articles on multivariate analysis. These journals include, but are not limited to:

- *Annals of Statistics* and *Annals of Applied Statistics*;
- *Journal of the American Statistical Association*;
- *Biometrics*;
- *Journal of Computational and Graphical Statistics*.

It is important to validate your choice of article with me before starting your project. You may send me a PDF of, or a link to, the article you are interested in. The deadline for finding your article is **February 29th at 8PM CST**.

Written report

The written report should be between 5-10 pages. The goal is to summarise the contribution of the article of your choice *in a critical manner*, i.e. understand the main findings of the article and how they relate to the broader literature. In other words, you need to explain how this particular article relates to previous findings. There are (at least) three ways to approach this:

- You can explain how the article relates to what we discussed in class.
- You can explain how the article relates to other articles you are familiar with.
 - This is your chance to make connections between this course and your own research.
- You can perform a cursory (or complete!) literature review to accompany your report.

Of course, you can use a combination of the above approaches. This report should emulate, but in a longer written format, how you critically think about the literature when performing a literature review.

The written report needs to be submitted electronically on UM Learn on **the week following the last oral presentation**, i.e. on **Friday April 17th at 8PM CST**.

In-class presentation

The **last two lectures of the semester** (i.e. April 3rd and 6th) will be devoted to in-class presentations. Each student will have 10 minutes (8 minutes for the presentation and 2 minutes for questions), and the order of presenting will be determined randomly.

You are required to prepare slides as a visual aid for your presentation. The goal of the presentation is to share your critical summary of your article. You should view the oral presentation as an opportunity to receive feedback from me and your colleagues that you can then incorporate into your final report.

You should send me your slides at least one hour before the lecture during which you are scheduled to give your presentation. The only file formats that will be accepted are PDF and HTML (no Powerpoint or Keynote file).

Evaluation criteria

Oral presentation (10% of your final grade)

- Provide sufficient background information
- Clearly describe the main findings of the article.
- Convincingly compare chosen article with relevant literature.
- Presentation is interesting and engaging.
- Presentation respects the allotted time.

Written report (20% of your final grade)

Your mark will reflect the level of completeness and effort put into each of the following:

1. *Introduction*: introduce the key ideas of the report.
2. *Summary of article*: briefly summarise the main contributions of the article you chose.
3. *Critical analysis*: compare and contrast these findings with other, relevant literature.
4. *Conclusion*: main ideas clearly and completely summarized; limitations and/or concerns stated.
5. *General Considerations*: ideas presented in logical order; sections well-organized; no grammatical, spelling and punctuation errors; appropriate level of details.

Resources for writing a critical essay:

- Unit 6 of Swales & Feak *Academic Writing for Graduate Students* (3rd edition)
 - The whole book is a great resource on academic writing in general, and I strongly recommend it.
- <https://www.science.mcmaster.ca/biopharm/images/files/handouts/critanal.pdf>
- <https://guides.library.queensu.ca/introduction-research/writing/critical>
- <https://depts.washington.edu/pswrite/Handouts/CriticalAnalysisPapers.pdf>