

# Guidelines for RenR 711 Course Project and Presentation

Deadline for draft: Oct 26, 2016 (worth 20% of your grade)  
Deadline for final submission: Dec 5, 2016 (worth 30% of your grade)

This assignment of a draft *website* and 5-minute, auto-timed *presentation* is to get you started and keep you on track with your course project. The idea is to get feedback from me and from your class mates on your project well before you submit your final version of the course project. Thus, your primary mission for this assignment is to convey to the class and to me what you want to accomplish and why.

Submit this assignment as a website and PowerPoint presentation. Your final course project will simply be an update of this assignment. To generate a website, I highly recommend the on-line HTML editor Weebly (<http://www.weebly.com/>). It provides robust cross-platform templates that look good on any web browser, and it is more than suitable to generate a simple 5-6-page project website that you can later save, fine-tune in Dreamweaver, and upload to your university website if you like.

If you are concerned about publishing your research on the web, add a disclaimer on the home page that “This is a class exercise based on modified or randomly generated datasets” and/or remove/alter any sensitive information that should not be public. You can also choose not to publish your website at all and submit it as a zip file to me if your activities are classified as top-secret – in that case, talk to me.

Below, I am suggesting a detailed structure for this assignment. This is meant as a guide to get you started in the right direction, but you are free to take this into a different direction. Your grade will not suffer as long as I can see quality work of any kind and I’m happy to read more than the suggested word targets.

## Website

### Home (~200 words)

**Title** – Aim for a short, descriptive and catchy title. This could be your main research question, e.g. “Does clearcutting really affect tree density?” or your main finding: “Clear cutting reduces tree density to zero”. Avoid uninformative titles such as “The effect of this ... on that ...”.

**Summary** – In plain words, describe what you want to accomplish with your study. Two or three sentences why your objective/question is important. Two or three sentences about your research approach: summarize your sampling procedure/experimental design/analysis. Two or three sentences about your results: describe your main findings in a concise and quantitative way (I observed a 20% decrease of tree density under the 1/5<sup>th</sup> harvesting treatment). End with your main conclusion.

**Visual Elements** – Use a photo or another visual element that represents your research topic.

### Intro (~500 words)

**Background & Rationale** – Describe the context of your research (background), why is it important or exciting (rationale). Do a minimal review of the literature with relevant references as a foot-note or in a reference section.

**Research Objectives** – State your objectives or research question in more detail than in the summary. What is your idea of the causal relationship between the response variable and the predictor variables? Are there several competing ideas, and does your research help to decide which one is correct? Are there practical applications of your research? Do you want to decide between two or more management options?

**Expected results** – Describe the expected results and possible alternative results of your study. Explain how the results would help you to answer a scientific question through exclusion of competing explanations, or how the results would help you to decide between different management options.

**Visual Elements** – Use simplified, conceptual graphs or diagrams/flowcharts to illustrate what the possible results of your study might be. Use photos of your experiments, trials, sample sites, or study objects to support your narrative or as decoration.

### **Methods (~200 words)**

**Data collection** – Briefly describe your sampling procedure/experimental design/measurement protocols. How did you select a sample from a population in a way that allows you to generalize? Only describe the data that you analyze as part of this project (i.e. not your PhD or MSc) and don't confuse the reader with anything else!

**Visual Elements** – Probably most important in this section to keep your reader's, audience's, or my attention. Use maps of your study sites and diagrams of your experimental and sampling designs rather than trying to describe that in a lengthy narrative. Ground or aerial photos of your field sites with diagrams drawn on top of them (e.g. transects, plots, treatments, etc.) can be very effective.

[**Statistical Analysis** – For the final submission, describe your statistical methods on this page. There should be a straight-forward description of how the methods work in principle and how you apply them to answer your research questions. **For the draft submission, leave this blank even if you have already done some statistical analysis with your data. Your project must make sense without stats, first.**]

### **Data (~500 words)**

**Data table** – Show and describe your simplified data table (i.e. include an abbreviated table displaying your variables in columns and a few sample rows of data. What are your sampling units or experimental units? What is the predictor variable(s)? What is the response variable(s)? Is the predictor variable manipulated in an experiment or simply observed? Is the predictor variable categorical or continuous? Again, strictly limit the description to what you analyze as part of this project.

**Exploratory graphics** – Explore your dataset with the graphical tools that we covered in class. Show diagnostic plots of your raw data (histograms, boxplots, or scatterplots) and describe what you did to check your data for errors. [For the final submission, show the results of any data transformations that you applied to meet assumptions of statistical analysis. If you cannot meet assumptions, discuss why]. You want to be selective and show a small number of high quality graphs. Mention in the narrative that you did the same for your other 48 variables. Number your figures and add figure captions and legends, so that the graphs are completely understandable without reading any of the text.

### **Results & Discussion (~500 words)**

**Data presentation** – Generally, statistical techniques should simply be a way to efficiently summarize and quantify what you already know about your data. Before doing any statistics, you should thoroughly understand the nature of your data. Calculate summary statistics and employ applicable graphical representations of your data and summary statistics (scatter plots with symbols/colors/bubbles, line plots, dot or bar charts with error bars). Number your figures and add figure captions and legends, so that the graphs are completely understandable without reading any of the text.

**Results and Discussion** – Be selective and only show a reasonable number of quality graphs with a high “Data-to-Ink” ratio. Discuss each graph (or group of graphs) with a separate paragraph that makes references to the figures (or tables) that you are talking about. Tell people what they see in the graph, point out interesting relationships, explain how they can be biologically interpreted, and/or what the practical applications of these findings are.

[*Statistical Analysis* – For the final submission, show the results of your statistical analysis on this page. For the draft submission, leave this blank even if you have already done some statistics with your data]

**Conclusions, About, References** – You may add these as additional pages, paragraphs or footnotes.

### **Suggestions for Presentation (5 minutes)**

**Format** – You have 5 minutes to present your project to the class for discussion and feedback. We do “Ignite” style presentations (<http://tinyurl.com/3lxmml>), where each slide auto-advances. Our approach is a bit more relaxed. You may use as many slides as you like and display each slide as long as you want, as long as they add up to 5 minutes total. To do this, check “Automatically advance” after X seconds on the animation ribbon for every slide, except your first title slide so that you can load your presentation and start it with the spacebar when everyone is ready. To make it yet easier to get the timing right, you may use the space bar to advance if your narrative is ahead of your slideshow. Confirm that the presentation runs through in 5 minutes without input. Make sure you boil your project down to a good and simple story that anyone can understand. You should not explain all the things you do for your entire PhD or MS thesis, but present a selected and interesting analysis that you prepare for RenR 711. Please with threes (rule of threes), using three main components: an opening, a body, and a closing. You may also aim for three questions and three take-home messages. For this presentation, avoid all bullets and text (titles and legends are OK). Talk to images, diagrams, and graphs.

[For the final presentation, simply update this talk with the results from your statistical analysis. Treat this second presentation as if the class has never heard what you did before (and usually much has been either never absorbed or has been forgotten since your first presentation). So, feel free to repeat anything from your first talk, except the hook or any jokes – those have to be original every time!]

For reasonably short presentations (5-15) minutes, it is advisable to please with threes in both structure and number of take-home messages. Do it like this:

#### **1. Opening: Hook, Background & Problem Statement** – (2-4 slides / 1-2 minutes).

A “hook” is an opening technique to focus people’s attention so that they don’t miss the title and your opening statement, and hence the entire point of your talk. This is very effective at busy conferences where people already suffer from information overload. Deliver your hook in 30 seconds or less, while your title slide is up and people are still not quite focused on you. There are many options for an effective hook:

Something about yourself or something that connects you personally to the research

Something you just “read this morning in the news” (fine if older news are elevated to new news)

A good joke or cartoon that is related to the talk. If you can’t stop giggling while thinking about it, it’s good. If it does not pass that bar, leave it.

An excellent hook is to relate *ad hoc* to a previous presenter in some way. This way you truly connect to an audience and make this a conversation.

Perhaps you can ask the audience an interesting question based on a photo or a prop that you bring

In this class (which hopefully is a safe learning environment), definitely try something! For a formal conference you need a good idea and feel comfortable with the delivery. Otherwise, leave this out and just be silent for a few seconds until the audience quiets down.

After your hook, briefly say what this presentation is about and state your research question/objective. You may say a few words about your species, your study site, and the context of your research: why is it important or exciting? State your questions, objectives or hypotheses. You can also take your conclusions to the front: “I will show you that...”. You don’t need an outline or overview slide for a talk that’s less than 20 minutes. It’s better to have a good story than excessive structure and outlines.

Practice your opening. Make it clear, simple, and short. What’s the problem? What are you going to do about it? This must be done within two minutes. If it is longer, you are rambling and you are already losing your audience.

#### **2. Body: Methods, Results and Discussion** – (4-8 slides / 2-3 minutes).

Briefly describe your data and experimental or sampling design using diagrams. Diagrams overlaid on photos are perfect for this. Limit the method description to what you analyze.

Use your results from either exploratory analysis of raw data, of from graphs and tables of descriptive statistics. Explain all graphs you show: What are the x and y axes? What do the points/lines/bars represent? Tell your audience what relationship or effect they see in the graph and explain how the findings can be biologically interpreted and/or what the practical applications are. Tell a complete story around a graph, if you can, including the interpretation and implication of the results. For the final presentation, add information from inferential statistical analysis.

### **3. Closing: Conclusion and take-home messages** – (1-2 slides / 30 seconds to 1 minute).

Aim for a nice conclusion, e.g. going full circle back to your opening statement or linking back to your original hook is very effective, giving the audience a natural sense of closure. Alternatively, or additionally, you can add some personal opinion, interesting speculation, or any kind of personal or scientific highlight of your study. For a short talk you don't need to explicitly repeat and summarize your results at the end. You may want to drive your main points home again in a different way (aim for three messages) – but avoid a “word for word” repetition of the exact same thing that you just said a minute earlier.

### **Evaluation Criteria (Assuming Completeness)**

**Website Layout (20%):** Use of headings, paragraphs, diagrams, photos, and graphs in your website. Everything should look polished with consistent fonts, font-sizes, colors, and symbols. Make use of white spaces between paragraphs. Use short paragraphs. Leave left and right margins. Group your graphs/tables/diagrams with paragraphs that describe these visual elements.

**Writing (20%):** Proper language and grammar. Logical writing: each paragraph should represent a thought. End paragraphs so that they logically lead to the next paragraph and open a paragraph so that there is a connection to the previous thought. There has to be a straight forward and reasonably interesting storyline from the first to the last page of your website (try to write science as you would write a story).

**Figures (30%):** I do not expect “Science” or “Nature” quality research, but I do expect that level of quality, neatness, and consistency in the figures. Use appropriate compression formats (PNG for graphs, JPG for photos). Make sure all graphical elements are easy to read and your figures make a visual impact. Err on the side of larger symbols, larger fonts, thicker lines, fewer tick-marks. Every image or table should be numbered and come with captions and legends right above or below. Put some effort into customization and use symbols and colors creatively.

**PPT slides (30%):** Avoid any text except in titles and legends. Instead, use quality figures, photos, and diagrams to support your narrative. A good score here will require minimal use of bullets and text slides. Use simple, high-contrast themes and avoid distractions such as clip-art, crowded slides, or funky animations.

- Note that this is a “guideline”. If you are not sure what you want to do, use this guideline to cover your bases. If this structure does not work for your project, or if anything does not make sense and/or you have a better idea: ignore the guidelines! In my approach to grading I always favor initiative and originality.
- **Note that you are neither evaluated on your presentation skills (although you will get feedback), nor on the value of your results for science, but you do have to come up with a reasonable rationale and/or interesting story for your project.**

### **Evaluation Criteria for final submission (Assuming Completeness)**

**Website Layout (20%):** as above.

**Writing (20%):** as above.

**Figures (20%):** as above.

**Analysis (20%):** Describe the statistical methods that you use and its assumptions. Describe why you selected this method and any alternatives that may exist. A full mark for this section requires that you choose the right method, recognize and preferably meet the assumption of the analysis, and interpret the results correctly.

**PPT slides (20%):** as above.