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### FOR 501.01: Research Methods

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**Paul Alaback**

Nested designs	
Regression-based designs	10/17
Assumptions/limitations	
Covariance analysis	10/19
Exploratory data designs	10/24
EDA approach	
Multivariate approaches	10/26
Model development	10/31
Types of models/Errors in models/Cause-effect	

**6. Data collection**

Sampling concepts	11/2
Systematic vs. random	
Stratified	
Subsampling	
Double sampling	

**7. Plot design**

Point (plotless)	11/7
Fixed plots	
Variable plots \	

**EXAM II**

11/9

**Presentations of thesis proposals**

11/14-12/14

**Evaluation: Unit                      Percent of grade**

Critical reviews (2)	5 each
Exams	30
Term project -Due 12/7	30
Presentation	30

**Term project:** The term project for Research Methods will involve the design and write up of a thesis proposal appropriate for submission to your thesis committee and to potential funding sources. Your term project will ideally focus on your thesis project. You are **strongly** encouraged to work closely with your advisor during the development of your project.

The purpose of this assignment is to encourage you to go beyond the initial phase of literature review and analyses and take on the task of designing an effective quantitative or qualitative experiment. This will involve synthesizing and applying many of the concepts presented in this course. In the process of designing your term project, you will not only be expected to set up an appropriate statistical or qualitative design, but also to develop all of the methods associated with the proposed research.

## Study Plan Model

### Forestry 501 – Research Methods

1. **Title Page**
2. **Table of Contents** – only if document is greater than 10 pages or contains many tables and figures.
3. **Abstract** – Short description of study plan.
4. **Summary of Problems and Project Plan** – Describes importance of the problem and the linkage to the problem to be solved. This also demonstrates that you have adequately reviewed the literature.
5. **Study Objectives** – Are defined through an iterative process linked to the Methods so that there is a 1:1 correspondence. A study objective is adequate if the following hold true:
  - a) The objective flows directly from the problem statement in terms of substance and scope.
  - b) The objective provides an exact, unambiguous statement of what will be accomplished, not what might be or should be.
6. **Variables and Sources of Variation** – is the heart of a quality study plan and reveals how well the researcher understands the nature of the information to be extracted from the data. The following can be specified:
  - a) dependent variable – is the main interest of your study and includes measurement units, precision and why it was chosen,
  - b) major factors (in order of importance) that influence the outcome of the study and how you plan to deal with the sources or variation. Basically you have four choices: (1) ignore, (2) control, (3) measure, (4) average.
  - c) Independent variables – identify which factors are to be quantified and how they relate functionally to the dependent variable.
7. **Planned Analysis and Study Design** – to be discussed in detail in two weeks.
8. **Field/Laboratory/Computational Procedures** – indicate how data will be collected in the field or laboratory and the kinds of computations required in sufficient detail so that another researcher having a similar background as the author can conduct the study.
9. **Planned Reports/Publications** – give an indication of the types of reports and/or publications that will result from the study.
10. **Time Schedule** – identify major tasks, people required, and the time required to complete the tasks. Use horizontal bar charts to show timeline for the beginning and end of each task
11. **Budget** – Show, in sufficient detail, the expenses required to complete the study. Include salaries, supplies, capital equipment, travel, overhead, contracted costs, etc... and indicate the balance between proposed tasks and monies required. Include a brief budget justification to describe why an amount of money is required for a given component.
12. **Appendices** – for placement of miscellaneous information

## Why Write a Study Plan

- 1) Clarify your thinking regarding the proposed research. This will help you determine if there are gaps in your plan
- 2) Facilitate peer review – gain assistance from specialists so that your plan will be improved and avoid costly mistakes
- 3) Provide a permanent record to permit study continuity and allow others to learn from your experience
- 4) Simplify ready execution of the research to facilitate your own work in the field or lab and to improve the potential ability for technicians to carry out the given study. The plan will also facilitate the revision procedures “mid-stream,” should they be needed
- 5) Enhance communication with your advisor and committee members.
- 6) Draw up a contract of performance
- 7) Avoid being asked: “why didn’t you do this?”

## Study Plan Evaluation

- 1) Is the writing clear, concise, complete, and unambiguous?
- 2) Is the problem statement or analysis adequate?
- 3) Are the objectives fully specified and researchable (can you tell when the objectives have been met and if they can be done)?
- 4) Are the methods a logical outcome of the objectives and are they adequately described so that another researcher can conduct the study?
- 5) Are the methods sufficient and efficient?
- 6) Are planned reports/publications an effective and efficient means of communicating the research results?
- 7) Are schedules and budgets complete and realistic?

## Presentation

You will be asked to evaluate the presentations of your fellow students. The process will be only for you peer's benefit, as we will assign grades based on our evaluation of the presentations. We will, however, provide your score sheets to the presenter. Please circle the most appropriate number for the each particular aspect of the presentation with 5 being excellent and 1 being poor. Do not sign your name.

### Evaluation

Abstract	Excellent	5	4	3	2	1	Poor
Introduction		5	4	3	2	1	
Hypotheses and objectives		5	4	3	2	1	
Methods		5	4	3	2	1	
Conclusions		5	4	3	2	1	
Flow of Presentation		5	4	3	2	1	
Visual Aids		5	4	3	2	1	
Clarity		5	4	3	2	1	
Speaking Rate		5	4	3	2	1	
Voice Inflection <sup>1</sup>		5	4	3	2	1	
Presentation Mannerisms <sup>2</sup>		5	4	3	2	1	
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<b>Overall Presentation</b>		<b>5</b>	<b>4</b>	<b>3</b>	<b>2</b>	<b>1</b>	

Comments:

1 Poor being flat voice and monotone.

2 Avoids repetitive actions and free of distracting movement