



**University of Southern California  
Sol Price School of Public Policy  
International Public Policy and Management Program  
(IPPAM)  
Summer 2017, 4 units**

**PPD 570:** Applied Statistics for Planning, Policy, and Management

Mondays, Wednesdays, June 26 – August 9, 3:00 PM – 6:20 PM, VPD 112

Computing Lab Thursdays, June 29 – Aug 3, 4:30 – 6:30, usually WPH B36



Prof. James Moore [jmoore@usc.edu]  
Von KleinSmid Center (VKC) 253  
Los Angeles, CA 90089-0626

Office Hours: Monday, Wednesday 1:00-2:30 (prior to PPD 570) or by appointment. We will pick an additional hour together in class.



Computing Lab Instructor:  
Dr. Michael (Cheng-Yi) Lin [chengyil@usc.edu]

Michael is a Price School PhD and full time staff member at the Milken Institute in Santa Monica. He is uniquely qualified, and we are lucky to have his help.

**Office Hours:**  
Thursday, 6:30-7:15 PM (following lab) or by appointment.

**USC Catalogue Course Description:** Use of statistical reasoning to answer questions related to public policy and management. Students will review and understand selected statistical techniques for analyzing data and for addressing public policy and management questions of interest using applied data analysis.

**sta•tis•tics** *n.* *Abbr. stat.* 1. The mathematics of the collection, organization, and interpretation of numerical data; especially the analysis of population characteristics by inference from sampling. Used with a singular verb. 2. A collection of numerical data. Used with a plural verb. [German *Statistik*, originally "political science dealing with state



affairs," from New Latin *statisticus*, of state affairs, from Latin *status*, manner of standing, position, state. See **sta-**]

**sta•tis•tic** *n.* 1. Any numerical datum. 2. An estimate of a parameter, as of the population mean, variance, or skew, obtained from a sample. [Back-formation from STATISTICS.]

Usage in **PPD 570**: The most important characteristic of a statistic is that it be a well-behaved random variable. If the statistic is not well enough behaved to have a known probability distribution, then there is usually no reason to be interested in it.

**da•ta** *pl. n.* *Singular datum.* 1. Information, especially information organized for analysis or used as the basis for a decision. 2. Numerical information in a form suitable for processing by computer. [Latin, plural of DATUM]

**Usage:** *Data* is now used both as a plural and as a singular collection: *These data are inconclusive.* *This data is inconclusive.* The plural construction is the more appropriate in formal usage. The singular is acceptable to 50 percent of the Usage panel.

Usage in **PPD 570**: Find a source of online data.

**sto•chas•tic** *adj.* 1. Of, denoting, or characterized by conjecture; conjectural. 2. *Statistics.* a. Random. b. Statistical. [Greek *Stockhastikas*, capable of aiming, conjectural, from *stokhazesthai*, to aim at, guess at, from *stokhos*, target, aim. See **stegh-**]

Usage in **PPD 570**: Realizations of stochastic variables take on random values distributed across some range. Some stochastic variables are vectors. Realizations of deterministic variables are nonrandom, possibly unknown, but by definition nonrandom.

**em•pir'•i•cal** *adj.* 1. Relying upon or derived from observation or experiment: *empirical methods, an empirical conclusion.* 2. Guided by practical experience and not theory, especially in medicine. **em•pir'•i•cal•ly** *adv.*

Usage in **PPD 570**: In an experimental context, we use systematic empiricism to test existing theories and construct new ones. In a correlation context, we still rely on empiricism, but in a less controlled way.

**em•pir•ic** (em-pîr'ik, im-) *n.* 1. One who believes that practical experience is the sole source of knowledge. 2. A charlatan: "we must not ... prostitute our past-cure malady / To empirics'" (Shakespeare). [Latin *empiricus*, from Greek *emperikos*, from *empeira*, experience, from *empeiros*, experienced in : *en-*, in + *peira*, experiment, trial.]

Usage in **PPD 570**: There isn't one. Nobody wants to be called an "empiric."



The point of statistics in applied social science is not to become more theoretical. The objective is to bring theory down to earth, and learn how to reconcile differences between what we believe with what we observe.



## Overview

This is a first course in statistics for new graduate students with no substantive prior exposure to the field. The course is designed and delivered especially for USC Price School IPPAM students. No prior work in statistics is assumed, but students should be capable of performing mathematics at the level of 11th grade algebra. We will cover the fundamentals of probability and statistics without (much) compromise, and then treat more ambitious topics in a survey fashion.

The lectures for this class will necessarily emphasize basic theory and procedures. There will be numerous applied examples. These applied examples are called “home work.”

The lecture meetings will summarize and organize the ideas put forth in the readings. We have only a very limited amount of time to cover this material, and routine attendance is strongly encouraged. As a matter of courtesy to all parties concerned, please arrive on time, and notify me of any premature departures with me prior to the event. If you come late, please be careful not to slam the door as you enter. If you must skip a class, it will not upset me, but the cost of mitigating the damage to your state of information is yours, not mine.

I will communicate with you at your USC NetID, which is also your USC email address. You are accountable for the information content of the messages I send to you. I will also post key messages as announcements on the course blackboard website, which you also access with your USCNetID. My email address is above.

## Objectives

This class is designed to provide you with:

1. a basic understanding of probabilistic and statistical concepts, with an emphasis on probability;
2. an ability to reason in probabilistic terms;
3. a set of accepted techniques that can be used to analyze, understand, and (hopefully) address many public policy and management problems and related

research questions; and the means to acquire new skills in this dimension as needed;

4. an understanding of how to ask statistical questions, and how to treat the information needed to answer these questions or offered in response to these questions;
5. a basic familiarity with statistical computing standards (by the time Dr. Lin is finished with you, I predict your familiarity will be very good); and
6. an understanding of why statistical analysis is a key element of your applied social science, graduate education, regardless of whether your objectives are further scholarship or professional practice.

## **Lectures**

Lectures are offered weekly each Monday and Wednesday afternoon during the last half of the summer semester. While this is a lecture-based course, questions and informed discussions that result have an important role. Because this is a survey class treating a wide range of techniques, not all topics can be treated in the detail they merit. Questions concerning clarifications, extensions, and applications are welcome and always encouraged. I will usually be able to pursue these discussions, but class members may sometimes find themselves asking reasonable, relevant questions that I will not take the time to answer during lecture. These questions can be pursued on the telephone, in email exchanges, or during office hours.

## **Evaluation**

Objective measures include class participation (a whopping 15%, so make the most of it and speak up with questions and observations), homework exercises (25%, probably five assignments, for which you may work together and receive copious assistance), lab participation and assignments (20%, Dr. Lin grades this component), a midterm examination (15%, in class), and a final poster (15%, see below for details).

Course Component	Weight
Homework: Average of 5	25%
Class Participation	15%
Lab and Lab Assignments	20%
Midterm Examination	15%
Final Poster & Presentation	15%



Floating Increment	10%
Total	100%

Incomplete grades can only be given if the terms the University defines for issuing a grade of “incomplete” are met. See *SCampus*, the USC Student Handbook, for the conditions under which students might legitimately request a grade of “incomplete,” and an instructor might legitimately accommodate such a request. Homework assignments will be distributed via blackboard and are due on the schedule indicated. Class members should respect this schedule. Late work will normally be declined.

Homework assignments are for instruction as well as evaluation. I am willing to discuss the homework assignments during office hours, and in class for that matter. Anyone who wants a perfect score on any homework assignment can probably get one by asking for assistance.

The weights for the various evaluation elements add up to 90%. An additional 10% will be added to the weight for that objective course component accounting for each student’s best performance. There are many ways for a student to turn in a performance that reflects knowledge lower than his or her true state of information, but relatively few ways for a student to deliver a performance reflecting a better state of information than the state he or she actually has achieved. Consequently, I place a premium on the importance of each student’s best score because this score includes more information than his or her lower scores. Consider the following example.

Student X:	Score (out of 100)	Weight	Contribution
Homework: Average of 5	90.	25%	22.50
Class Participation	88.	15%	13.20
Lab & Lab Assignments	85.	20%	17.00
Midterm Examination	82.	15%	12.30
Final Poster & Presentation	93.	15%+10%=25%	23.25
Course Total			88.25*

\* This is probably an “A-,” or at worst a “B+”

Cooperation is usually the least expensive means of overcoming difficulty, so I urge students to work homework assignments in teams. The midterm examination must be completed alone. You are strongly encouraged but not required to execute homework assignments in teams of two to four members. Team members will receive identical grades on group assignments. If you have not contributed to the completion of a homework assignment, please do not pester your colleagues to fraudulently append your



name to their work. This would be a violation of University Conduct Code § 11.15, 11.17, 11.21, and 11.31. See the information below on academic integrity.

All homework should be submitted electronically as an email attachment to me at [jmoore@usc.edu](mailto:jmoore@usc.edu). Submit a single attachment for each assignment, and make sure it identifies your group members. Please do not submit multiple attachments. The class is small enough that, since you are allowed to work in groups, I think we can skip the blackboard assignment manager. I will acknowledge your email submissions. Keep an electronic copy of your submissions for your records, in any event.

I prefer that final exercises be individual efforts, but the final poster presentation is the kind of assignment at which groups excel, so you should work in groups of size 2. That will give us 9 presentations on the final day.

### **Website**

Most class handouts will be distributed through the course website <https://blackboard.usc.edu/>. There is additional information available at the website, more than we will use in our course. It is there for reference. You are not responsible for every document posted there. I will direct you to what you need to know.

You should use your USC NetID to log into this site. The site is password protected with the same password as your USC NetID. You may also view a record of your scores on the website if you access the site.

To log into the course website, you must execute the USC Information Technology Services (ITS) first login procedure. This is web based. Go to

[https://netid.usc.edu/account\\_services/activate\\_account](https://netid.usc.edu/account_services/activate_account)

You will see a screen like the one below.





## Activate your USC NetID

Your USC NetID gives you access to [online resources and tools](#).

Follow the steps below to get started.

1

Find your USC NetID

2

Set secondary email address

3

Create new password

10-digit USC ID number  
(from your USC Card)

[Help me find it](#)

0123456789

Date of birth  
(MM/DD/YYYY)

[Why we're asking](#)

/ /

[Find your USCnet ID](#)

Call us at [213-740-5555](tel:213-740-5555)  
[consult@usc.edu](mailto:consult@usc.edu)

**Tip:** If you need help from USC Information Technology Services, call them at 0-5555. I doubt that an email to [consult@usc.edu](mailto:consult@usc.edu) has ever drawn a response in the history of the institution.

### A Few Additional Points the Provost Would Like Me to Mention

#### Academic Conduct

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Part B, Section 11, “Behavior Violating University Standards” <https://policy.usc.edu/scampus-part-b/>. Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct>.



## **Support Systems**

### ***Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call***

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.  
<https://engemannshc.usc.edu/counseling/>

### ***National Suicide Prevention Lifeline - 1-800-273-8255***

Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. <http://www.suicidepreventionlifeline.org>

### ***Relationship & Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call***

Free and confidential therapy services, workshops, and training for situations related to gender-based harm. <https://engemannshc.usc.edu/rsvp/>

### ***Sexual Assault Resource Center***

For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: <http://sarc.usc.edu/>

## **Computing**

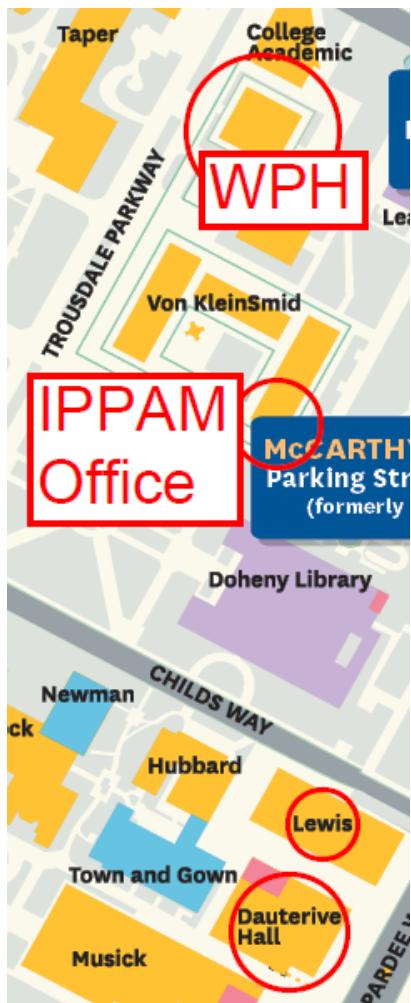
Statistical procedures were revolutionized by the availability of low cost computers, largely the way everything else in our life has. Our homework assignments are small and fundamental enough to be executed by hand with a calculator, but you are encouraged to organize your work with Excel if so inclined.

The course includes a computing lab experience to provide you hands on experience with statistical software, specifically the Strategic Analysis System (SAS, formerly the Statistical Analysis System, [http://www.sas.com/en\\_us/company-information.html](http://www.sas.com/en_us/company-information.html)). The labs are organized and led by our very experienced and rather excellent Lab Instructor, Dr. Michael Lin [chengyil@usc.edu].

There will be computer lab sections during most weeks in the semester, scheduled so as not to conflict with other IPPAM courses. The computing labs will meet on the Thursdays from 4:30 PM to 6:30 PM. SAS instruction begins starting June 29, and runs until July 27, in Waite Phillips Hall (WPH B36, mysteriously unlabeled on the USC map) Computer Center. The final lab meeting is August 3 in SAL 127.



Week	Thursday	Time	Location	Topic
1	June 29	4:30-6:30	WPH B36	SAS Introduction & MS Excel for Descriptive Statistics
2	July 6	4:30-6:30	WPH B36	SAS Data Sets Part I & Descriptive Statistics + Graphs (SAS & Excel)
3	July 13	4:30-6:30	WPH B36	SAS Data Sets Part II, Data/Variables Management I & Data Sources
4	July 20	4:30-6:30	WPH B36	Lab Mid-term Exam, Variable Management II, SAS Data Sets Part III
5	July 27	4:30-6:30	WPH B36	Correlation Coefficient, Regression Analysis & Data Presentation I
6	August 3	4:30-6:30	SAL 127	Data Presentation II, Miscellaneous Topics, Wrap-up & Lab Final Exam



Considerable statistical consulting assistance is also available from the ITS consultants at (213) 740-5555. There is an email address stats@usc.edu mentioned on the USC Libraries pages, that used to be very helpful, but my last test message drew no response. See also <http://itservices.usc.edu/stats/sas/> and <http://itservices.usc.edu/stats/sas/elearning/>.

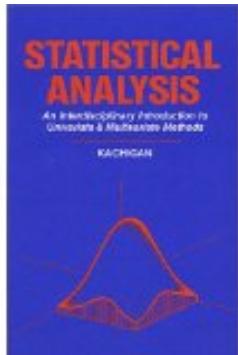
### Teaching Assistant

We don't have one. It is just us. There is a grader assisting me, IPPAM student Martua Panggabean, who did very well in PPD 570 previously.

The Lab Instructor, Dr. Lin, is responsible for the statistical computing lab. Questions about how to proceed with respect to the lecture material and home works should be directed to me. Questions about how to proceed with respect to the computing lab and lab assignments should be directed to Dr. Lin. Martua is available to answer questions about grading decisions, but he does not have the range of responsibilities associated with a Teaching Assistant, so other questions about the material should normally come to me.

## Required Texts for the Statistics Lecture

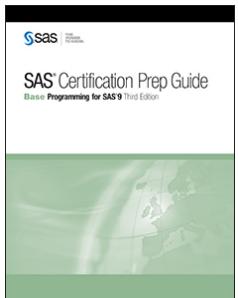
Assigned readings are important and will contribute significantly to your understanding of the lecture material. Fortunately, both the required text and the lecture notes are reasonably clear. The first-best strategy is to skim the assigned material before class, attend lecture and listen carefully, and then read the text assignments afterwards with discrimination.



Kachigan, Sam Kash, *Statistical Analysis: An Interdisciplinary Approach to Univariate and Multivariate Methods*, Radius Press, 1986. This is available in USC Gift and Convenience Store (formerly the USC Book Store).

*Supplemental Readings and Lecture Notes for PPD 570: Applied Statistics for Planning, Policy, and Management*, Summer 2017. This is available on the course website.

## Recommended Texts For the Computing Lab



Additional reading material you need for the computing lab will be provided by Michael. Some will come from SAS, *SAS Certification Prep Guide: Base Programming for SAS 9 (Third Edition)* SAS Institute Inc., 2011. <https://support.sas.com/pubscat/bookdetails.jsp?pc=63049>). Don't purchase this book. It is expensive. Dr. Lin will distribute what you need.

## Poster Presentation

Your final exercise in PPD 570 is a poster presentation. A research poster is a way to express an idea, concept or concern to a large number of people with a limited amount of resources in a short period of time. Posters have an advantage over oral presentations and papers in that they allow people to absorb information at their own speed, can simultaneously express issues to a large group, is not speaker dependent, and requires very little investment on the part of participants. Most professional conferences for researchers and others have poster sessions, so it is useful to learn the tools and techniques of this style of presentation.



## Statistical Analysis

Using data gathered from research of common data sources or through your own personal research, develop a testable hypothesis related to social, political, economic, medical or other policy issues. Posters will be informational as well as analytical, and assumptions about the prior knowledge of your audience should be limited.

### **Data**

Generally speaking, finding data to study is usually the most difficult thing to do. The USC Libraries Research Guides webpages (<http://libguides.usc.edu/>) can direct you to multiple public database resources from which you can download data, including databases relevant to specific topics such as political science, international relations, and the like. The USC Library also has a statistics and data homepage that may well help you, <http://libguides.usc.edu/data>. I am happy to act as consultant to tell you if you are going down the right path, but the determination of the proper test, etc. is up to you.

### **Hypotheses**

Once you find data, posing a hypothesis is the next challenge. It is in no small part limited by the type of data gleaned from your searches.

Once you have your hypothesis, have tested the hypothesis and have a conclusion, the real work of the presentation takes place. The presentation probably is not what you are used to. If you do your job right, you will never have to say a word. The objective is to have the poster speak for itself without need for intervention or clarification. You will be standing by your poster to answer any questions, but ideally your poster should be a self-contained source of information.

To give you some guidance, imagine this scenario. Your supervisor has asked that you put together a presentation for her to give at a meeting in three weeks. One week before the presentation, she is hospitalized after breaking her leg snowboarding. The organization chart for your agency, and proper protocol, requires that your supervisor's supervisor make the presentation. However, there is one problem: She's on maternity leave for the next four weeks. The presenter of your presentation will be your supervisor's supervisor's supervisor. Do you think that he will understand all the intricacies of the issue? Your presentation must stand alone, and it's got to be good enough for your supervisor's supervisor's supervisor to present and feel secure in front of an audience.

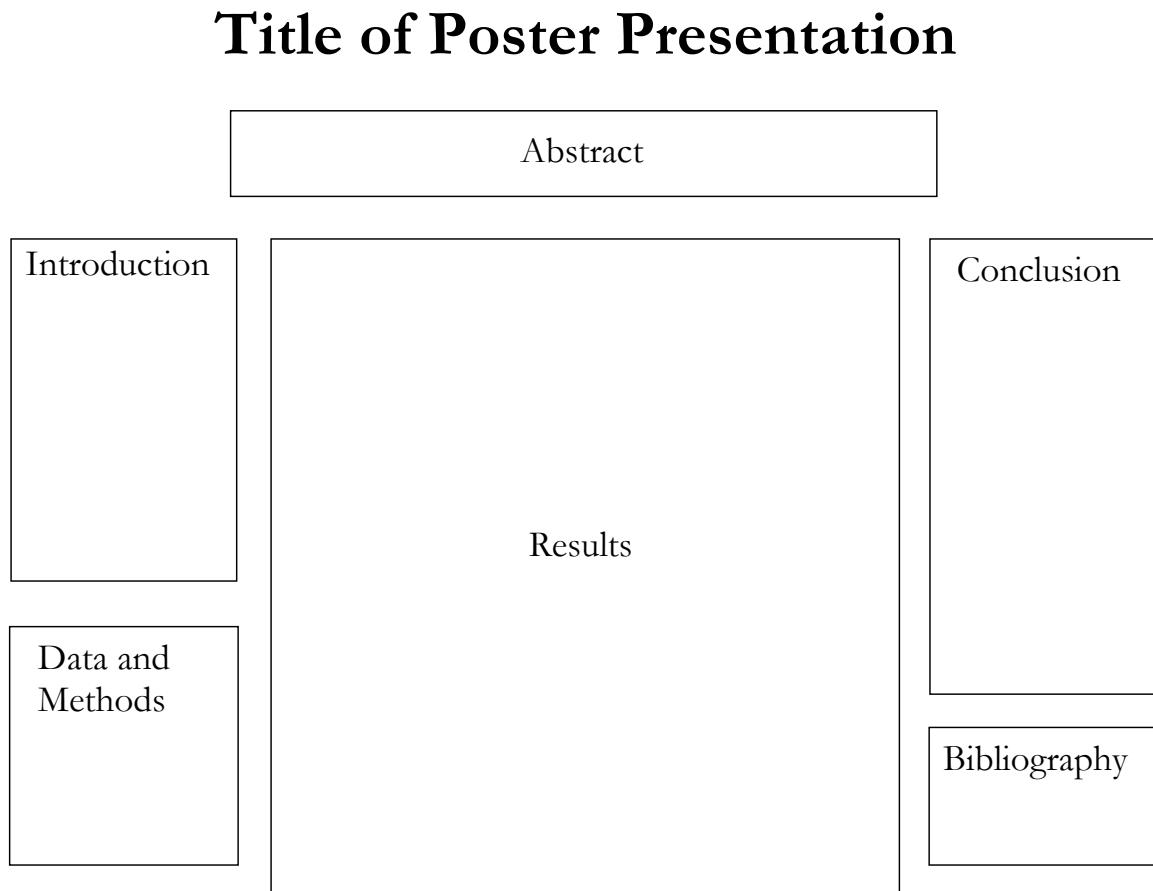


## General Design

All posters follow a general format, and this expectation is on these presentations as well. Sections generally enumerated are:

- Title
- Abstract
- Introduction
- Methodology
- Results
- Conclusion

A sample poster design might look like this:



### ***The Abstract***

The purpose of an abstract is to summarize the purpose, analysis, and conclusion of a poster without the reader needing to read the balance. It should include a discussion of what is being studied, how the sample was formed, how it is being tested, and what the



conclusion of your poster states. This generally means that an abstract is somewhere between 5 and 8 lines, and between 50 and 100 words.

Most often this is the weakest part of the presentation because people summarize the wrong things, add unimportant details or miss the point of an abstract by complicating the language. Consider the following abstract:

*A case study of the Shanghai Second Sewerage Project addresses the role that environmental impact assessment could play in promoting sustainable development projects in the People's Republic of China. This project entailed phased construction of a comprehensive sewerage system to improve surface water quality. The adequacy of the completed environmental impact of a proposed deep water outfall was deemed unsatisfactory as a result of weak consideration of alternatives, lack of environmental policy priority, and other process deficiencies. Improvements in institutional expertise and political motivation are advocated. Source: Environmental Impact Assessment in the People's Republic of China: A Case Study of the Shanghai Second Sewerage Project Sarah Hoyle, University of Salford, Salford, UK, Shahed Power and Simon Hutchinson; Environmentalist, Sep 99, v19, n3, p251(7) research article*

This is about 125 words, so it is a little on the long side for an abstract. On reading this abstract, you can see what the point of the study is, the outcomes, the recommendations, and the direction of the conclusion. You understand this poster and it provides a frame of reference for the balance of your reading. A good abstract provides a clear and concise synopsis from the perspective that you have about 10 seconds to capture your audience.

### ***Introduction***

The introduction is your first opportunity to explain what you are doing. Most often it is evaluated on two grounds. First, an introduction must give the reader context. You should assume that no one has knowledge of your subject. This is not an easy task: We often assume that our audience has the same knowledge that we do, or that an issue is subject to common knowledge. For this, there are two important rules:

First, an introduction should clearly define the problem being studied. Often, this includes discussions about the nature of the problem, the implications of the issues being discussed, and a brief history, if appropriate. The introduction paints a picture to the reader about the people, places and things involved in your study.

An introduction on the effects of the construction of a football stadium in Los Angeles should include a discussion of the history of football in Los Angeles, the fact that it had two teams for a period, the dispositions of those teams, the effects of their departure, the



reason why this is an important issue to be considered (often because of the question of using tax dollars to finance construction bonds).

### ***Data and Methods***

The data and methods section is key to grading this assignment in this course.

Your poster must contain a test of significance and a measure of association. Neither is generally sufficient, and the determination of which to use is based on the nature of the variables of interest. The variables determine the appropriate test. The methods should include the alternate and null hypothesis, the alpha level, the critical value, and any other information appropriate to the test.

Because the hypothesis may not indicate if the criterion variable, for example, is a discrete variable, the methods should also include the type of variables being tested. The categories for any discrete variables should clearly identified.

Another issue is data collection. You must include the metadata for the dataset that you chose to use, as well as other important information about the source of that data. Where does it come from? What is the population? How was the sample selected? Is it possible that the sample is unrepresentative?

Your methodology must be explicit enough to allow someone who has never seen your paper before to duplicate your research with the expectation that such a process will generally lead to similar results. Methodologies are also your opportunity to address why, for example, you could not get a simple random sample from the population, and make a case for the validity of your sample before you present your results.

And finally, it must all be done in a narrative form, i.e., in essay form.

### ***Results***

The results section is your opportunity to graphically represent your data, show your results, and identify important issues. Here is where you put the graphs, the charts, etc. If you are conducting an analysis of category data, your table should be here. Linear regressions should be presented in this section, as well as the line of best fit, the equation for that line, etc. Make sure that these charts are easy to read and remember to label your axes.

This is where you show how statistics can be made accessible to readers without statistical training. Your results should be presented in a manner that appeals to both the technician and the layperson – one with a proficiency in statistics and the other without. If you address one crowd without the other, you invite attack against your work. The



layperson can say that you are attempting to hide things. The technicians will say that your results are not robust.

### ***Conclusion***

Your conclusion should include a discussion of your results and their broader implications. This includes an analysis of the facts you've presented and an objective indication of what they mean. If *results* is where the diagrams go, then the *conclusion* is where you identify what the diagrams mean. It should be objective in its presentation, generally free of bias. A discussion should also include a direct critique of your work, pointing out weaknesses and presenting alternate interpretations.

Once this analysis is done, you can go on to inform your viewers about the broader implications of your results. You started with a question in the introduction. Now you need to provide an answer. It may not be a complete answer, but you should be able to propose some recommendations based on your analysis and present ideas for future work.

### ***Bibliography***

Cite all relevant sources in APA (American Psychological Association) format. Sometimes referred to as the technical reference style, this is the leading reference format for social science publications.

### ***Presentation***

Although not an explicit part of some presentations, it is a grading criteria here – and this is the role of presentation. Presentations are judged on first impression just as people are. You have 10 seconds to capture the attention of your audience and it must be time well spent.

Presentations should look professional, tasteful and creative, but most importantly they must be legible. No font smaller than 16pt should be used in any part of the poster, and larger fonts are preferable. The International Studies Association provides good advice to their poster presenters: <http://www.isanet.org/Conferences/Special-Convention-Programs/JSS/Presentation>.

### **PowerPoint Presentation**

Given the information age in which we live, you have the option of doing this presentation using a computer program rather than making a physical poster. It would be amusing if you made at transparency for display on an overhead projector, but don't. You are free to use any presentation program you like, such as PowerPoint. Presentations should follow the same format (i.e. headings) as the poster description above. Please



make sure your presentations look professional, and do not contain excess color, action, or unnecessary effects that will detract from your work.

## Presentation Parameters

I will grade the poster presentation based on the following criteria:

- Presentation design
- Presentation parameter criteria
- Appropriate statistical design
- Explanatory methodology
- Critical analysis
- Clarity of design
- Attention to detail
- Clarity of writing
- Grammar and spelling

The balance of the grade is focused on the quality of feedback you provide to other students. You must grade four presentations to earn full credit. Evaluations are graded based on:

- Completeness
- Evaluation of presentation parameter criteria (you should point out when they didn't follow the presentation rules)
- Critical analysis of statistics used
- Attention to detail
- Clarity of writing
- Readability



## Planned Course Schedule and Outline

<u>Topics</u>	<u>Assigned Readings</u>	<u>Lecture Date</u>
I. Fundamental Concepts		June 26
II. Data Reduction		K pp 1-28
A. Frequency Distributions		K pp 29-42
B. Central Tendency		June 28 HW 0 due
III. Probability		K pp 43-53

A. Basic Probability		
...Sample spaces and set logic		
...Simple discrete probability distributions		K pp 73-87



...Expected value of a random variable	July 5	K pp 97-98
...Conditional probability		K pp 87-97
B. Advanced Probability Topics		
...Bayes formula and decision trees	July 10	K pp 476-488
...Permutations and combinations	HW 1 due	K pp 462-468

## IV. Inference

A. Variation	July 12	K pp 54-72
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<b>B.</b> Sampling Distributions:		<b>K</b> pp 102-131
...Samples		
...Normal distribution		
...Statistics as random variables		
...Central limit theorem	July 17	
	<b>HW 2 due:</b>	
<b>Submit a written description of your proposed poster topic, data sets, criterion variable, and key explanatory variables</b>		
...Proportions as means: Binomial distribution		
...Hypergeometric distribution		<b>K</b> pp 471-473
...Poisson distribution		<b>K</b> pp 473-476
<b>C.</b> Parameter Estimation:	July 19	<b>K</b> pp 134-159
...Point and interval estimates	<b>HW 3 due</b>	
...t-statistics		
<b>D.</b> Hypothesis Testing:		<b>K</b> pp 160-185, 189
...Types of hypothesis sets		
...Tests of a mean		
...Type I and Type II errors		
<b>MIDTERM EXAMINATION</b>	July 24	<b>In Class</b>
<b>POSTER SESSION PROGRESS REVIEW</b>	July 26	

## V. Association (Fundamentals of Multivariate Analysis)

<b>A.</b> Simple and Serial Correlation Analysis	July 31	<b>K</b> pp 195-226, 233-234
	<b>HW 4 due</b>	<b>B</b> pp 125-149 (lecture notes)
<b>B.</b> Nonparametric Statistics		<b>K</b> pp 452-461
<b>C.</b> Analysis of Category Data	Aug 2	<b>K</b> pp 342-354
<b>D.</b> Simple Regression Analysis:		<b>K</b> pp 238-259
...Basic linear model and assumptions		
...Significance tests and confidence bands		
...Proportion of variance explained		



E. Multiple Regression Analysis	Aug 7 <b>HW 5 due</b>	<b>K</b> pp 259-271 <b>H</b> pp 61-72 (lecture notes)
F. Multiple and Partial Correlation Analysis (Qualitative): Relationship to Multiple Regression		<b>K</b> pp 226-232
<hr/>		
G. Analysis of Variance (ANOVA)		
...One Way ANOVA and Multiple Regression		<b>K</b> pp 272-282
...Factorial Designs		<b>K</b> pp 282-297
V. Poster Presentation	Aug 9	
Each student team will present a poster and will be responsible for rating the posters of other teams.		

This schedule is optimistic, but likely feasible. You will find these techniques useful in many ways. In any event, this schedule is not a contract, and will probably be subject to minor revisions subject to our joint capacity for progress.



**PPD 557 Homework 0**  
**Summer: Due Wednesday June 28, 2017**

**Skills Assessment**  
**Prof. Jim Moore**

This exercise is ungraded, but I will record submissions. Response is required.

1. Consider the following expression, which gives  $y$  as a function of  $p$ ,

$$y = f(p) = \ln [p/(1-p)] = \ln [p \bullet (1-p)^{-1}].$$

I want you to invert this function and solve for  $p$  as a function of  $y$ ,

$$p = g(y) = f^{-1}(y).$$

Record the time it takes you to complete the problem. Some of you might not be able to solve the problem. Some of you will consider it trivial. If you cannot attack the problem, the time required to complete it is  $\infty$ .

2. Send me email ([jmoore@usc.edu](mailto:jmoore@usc.edu)) identifying the members of your homework group. Copy the grader ([panggabean@usc.edu](mailto:panggabean@usc.edu)).
3. Welcome to the University of Southern California. This won't hurt a bit.

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Prof. Jim Moore has permission to distribute my likeness, nationality, and personal email address to my classmates in PPD 570 to support communication and group formation.

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