Statistical Package for the Social Science (SPSS) and Sample Power 3

Introduction to the Practice of Statistics

UF INFORMATION TECHNOLOGY

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**Statistical Package for the Social Science (SPSS) and Sample Power 3**

Introduction to the Practice of Statistics

**Instructor**
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**Class Meeting**
Online. Dates: September 16th (8:00 am) to November 1st, 2019 (5:00 pm). I will attend a conference during Module 5, October 16th – 18th, but you will have enough resources to do the activities and the exercises by your own. In addition, you can help out each other by using the forum.

**Goal and Objectives**
The goal of this course is to introduce the SPSS and Sample Power applications to faculty, staff, and students with no knowledge or basic skill in SPSS and Sample Power. This workshop will teach participants the fundamental procedures that will allow them to continue by their own. After completing this course, participants will be able to:

- Describe the SPSS interface. Enter and save data. Import data from Excel.
- Do data preparation and exploratory data analysis.
- Create charts, histograms, and box plots.
- Transform variables.
- Perform statistical analyses such as t-test, one-way and two-way ANOVA, bivariate and multiple linear regression, Chi-squared, and logistic regression. The majority of these tests will have the corresponding non-parametric procedure.
- Carry out the power analysis for each of the Statistics tests mentioned above.

**Course Description**
IBM SPSS Statistics 26 is a comprehensive system for analyzing data. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and complex statistical analyses. SPSS makes statistical analysis more accessible for the beginner and more convenient for the experienced user. Simple menus and dialog box selections make it possible to perform complex analyses without typing a single line of command syntax. The Data Editor offers a simple and efficient spreadsheet-like facility for entering data and browsing the working data file.
This course has not been designed to teach Statistics. Participants should know basic or advanced Statistics in order to take this course. Some background material needs to be covered in order to understand the analysis, but the theory behind each analysis will not be explained.

The dynamic of the course will follow taking the background knowledge quiz, reading the tutorial, watching the videos, carrying out tutorial and skill activities, participation in the discussions, and doing the exercises. Class will be limited to 30 students. We will cover one module per week, and we have seven modules scheduled as explained below.

Course Content

**Data preparation**
- Getting familiar with the interface
- Enter, save and import data from Excel
- Carry out different data preparation processes

**Exploratory Data Analysis**
- EDA for one or more variables
- Create charts for one variable
- Transform data
- Transforming scale into categorical variable

**Inferential Statistics for the mean and the median**
- Descriptive statistics for two or more variables
- Creating and editing charts for two or more variables
- Inferential statistics for the mean and the median
  - One-sample t-test and sign test
  - T-test and Mann-Whitney U Test
  - Paired-difference t-test & Wilcoxon Signed-Rank Test
  - Power Analysis for t-test

**ANOVA and simple linear regression**
- One-way and two-way ANOVA & Kruskal-Wallis Test
- Bivariate linear regression
- Power Analysis for ANOVA

**Multiple linear regression**
- Multiple linear regression and correlation
- Model building and selection
- Interpreting regression coefficients and confidence intervals
- Quantifying and dealing with multicolinearity
- Power Analysis for linear regression

**Inferential statistics for the proportion**
- Inferential statistics for categorical variables:
  - One-sample binomial test
  - One-sample Chi-square
  - Chi-Squared Test of Independence
  - Power Analysis for the proportion

**Logistic regression**
- Assumptions
- Estimating and interpreting regression coefficients and confidence intervals
- Maximum likelihood estimator and Wald statistics
- Modeling scale, binary and categorical variables
- Power analysis for logistic regression
Pre-Requisites
Since this course does not teach Statistics and it has been designed for faculty, staff, postdoctoral candidates, TAs, and graduate students, at least a graduate-level Statistics course must be taken before enrolling. The content of the course follows the main statistical procedures covered by STA 6126 and STA 6127 at the University of Florida. Hence, it summarizes these two courses in approximately 28-35 h. Other statistical courses that can be used as examples are the following: EDF 6402, EDF 6403, EDF 7405, ALS 5932, and HLP 6515 at the University of Florida. If you are in doubt about registering in the course, please email the Syllabus of the course to me (joselugo@ufl.edu), and I will let you know whether you can enroll.

SPSS Textbooks
Below are the most current list of textbooks in SPSS. The cheapest ones are George’s and Kerr’s; the last one follows the same structure of research methodology used in this course.

- Maujis, D. Doing Quantitative Research in Education with SPSS. 2nd Edition. SAGE Publications, California, USA.

Statistics Textbooks
If you have not used statistical analysis for some time and do not remember the concepts and procedures, you must review them before taking the SPSS course. Below are two good textbooks that I recommend.


Commitment with the Course
All modules are mandatory. Particularly, the first two modules are essential because the skills learned from them will be needed in the other modules. Every module will be taught per week, and your participation is critical to successfully complete the course.

Please, allow me to explain what participation means. If you are interested in this course, you must follow the work flow: take the background knowledge survey, study the tutorial and other resources, watch the videos, do the tutorial and skill activities, participate in the discussion, and do the exercises. Yes, it is exactly like taken a registered course. The only difference is that the final grade will not be included in your accumulative GPA. If you are planning to attend the course just to take the materials and watch some videos, this course is not for you, and I will highly appreciate that you give your seat to a more interested student. You will not be allowed to participate in the next module if you failure to follow the work flow and do not have a score equal or greater than 80% in each evaluation.

Getting to Class
This is an online course implemented though the course management system “Canvas” at the University of Florida. Class weekly sessions are organized by Modules. Each week you should access the Module by clicking on Home and selecting the topic taught in that week or you can go to the Modules tool in the Navigation Bar and open the topic corresponding to a specific week. Each module has background knowledge, resources, objectives, learning materials, activities (tutorial and skill), discussions, and exercises with feedback. The recommended readings and learning materials have all the content required for you to learn and to satisfactorily pass all evaluations. If you follow the work flow, you guarantee your learning.
Class materials and activities will be opened every Friday at 12:00 pm. The due date to submit the activities, participate in the discussion, and turn in the exercises will be the next Friday at 11:30 am. All these information and details will be displayed in Canvas.

**Course Evaluation and Certificate**

This is a fast paced, intensive hands-on, 7-week course on elementary statistical analysis. Since the course is online, it requires you to be focused, a high level of interest, motivation, responsibility, and excellent communication skills. It is your responsibility to go over the materials, learn and practice the statistical procedures. You are committed to work and learn mainly independently.

I will evaluate your knowledge, skills, and your level of satisfaction. Knowledge and skills will be assessed by using background knowledge, activities, and the exercises. At some level, your post in the discussion shows how familiar you are with the theme of discussion. Some activities have a rubric that you can use to make sure you obtain full credit. I will be strict with the interpretation of the results. Particularly, I want you to write down in full sentence the interpretation of the results by using the correct statistical terminology. You will also have the opportunity to evaluate the course with a satisfaction survey every week. I need to know if you have any suggestion that I can implement during the next session. I will not need to wait until the end of the course to improve it.

All activities, discussions and exercises will be scheduled by using Canvas. No late submission will be accepted unless there is a reasonable excuse. If you want to work in teams, you are welcome to do so, but writing down the assignment must be an individual work. Please, notify me if you are creating a group.

Discussions will evaluate your individual contribution to the online class. In addition, they do reflect your knowledge on the subject matter. There will be one discussion topic in each class. You must provide a written statement about your opinion or thoughts regarding a specific topic, raise a question for the audience, answer at least to one classmate’s question, and read all comments. I will follow the discussion, but I will not actively participate. My role will be as a moderator, and I will be answering questions and/or clarifying doubts.

A forum will be available in each module. The main objective is to establish a collaboration among participants. You will be allowed to ask questions about the activities and exercises. I am sure that your classmates will answer those questions to help you out to move on in your work flow.

This course will give you a certificate if you participate in the seven modules and obtain a passing score equal or greater than 80% as your final grade.
Cheating, lying, or plagiarism in any form will not be tolerated. If you are caught under any of these inexcusable behavior, you will be dismissed from the course.

**Grades and Grading Scheme**
Background knowledge, tutorial activity and discussion have the same weight (10%). The skill activity has more weight (20%). Exercises have 50% weight because you will apply your knowledge and skills.

The Grading Scheme is as follows:

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<th>Score</th>
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<th>To (%)</th>
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<tbody>
<tr>
<td>A</td>
<td>100</td>
<td>94.0</td>
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<tr>
<td>A-</td>
<td>&lt;94.0</td>
<td>90.0</td>
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<tr>
<td>B+</td>
<td>&lt;90.0</td>
<td>87.0</td>
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<tr>
<td>B</td>
<td>&lt;87.0</td>
<td>84.0</td>
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<tr>
<td>B-</td>
<td>&lt;84.0</td>
<td>80.0</td>
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<tr>
<td>C+</td>
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</table>

Any score below B- is considered failure in this course.

**Accomodation for Students with disabilities**
If you need classroom accommodation because of a disability, you must register with the Dean of Students Office (http://dso.ufl.edu/drc). This office will provide you several forms, and one of them must be turned in to the instructor. Since some of these accommodations require time to be in place, I will appreciate that the form is giving to me with two weeks in advanced.
General Notice to Participants

Course Policies

• You are responsible for following the work flow and for studying all materials and resources posted within the course in Canvas.
• You are responsible for submitting all activities, discussion posts and exercises as scheduled in Canvas.
• The course starts on 09/16/19 (8:00 am) and ends on 11/01/19 (5:00 pm). Therefore, plan well your daily work to make sure that you can successfully complete this course in addition to other courses you might have.
• If you have questions about the course, evaluations or grades, please contact me at joselugo@ufl.edu or through the email in Canvas.

SPSS and Sample Power License
UF faculty and students can use SPSS Statistics v.25 and Power Sample 3 free from UF Apps at: https://apps.ufl.edu/vpn/index.html. This option is not available for staff yet. If you are interested to purchase the license for one year, faculty, staff and students can obtain the license for SPSS Statistics v.26 and Sample Power 3 at the Help Desk. Follow this link: http://helpdesk.ufl.edu/software-services/spss/ to know the academic price and how to acquire the software.

Software Use
All faculty, staff, and students of the University are required to obey the laws and legal agreements regarding software use. It is illegal to copy licensed and/or copy written materials. This is a third degree felony under Florida law. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. The Office of Academic Technology and the members of the University of Florida community, pledge to hold our peers and ourselves to the highest standards of honesty and integrity.

UF Counseling Services
Resources are available on campus for students having personal problems or lacking clear career and academic goals that interfere with their academic performance. These resources include:

1. U Matter We Care, 352-294-2273 | umatter@ufl.edu, help for students in distress
2. Counseling and Wellness Center, 3190 Radio Road, 392-1575, personal, sexual assault, and career counseling
3. Career Resources Center, Reitz Union, 392-1601, career development assistance and counseling