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: January 16th (8:00 am) to March 15th, 2023 (5:00 pm).

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 course 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. Most 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 29 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 set.

This course has not been designed to teach statistics. Participants must know basic or advanced statistics to take this course. Some background material needs to be covered 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, and carrying out tutorial and skill activities. There are exercises for the people who want more practice, and they are strongly recommended. **The course is self-paced**, 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 and quantile regression
- Power Analysis for ANOVA

Multiple linear regression

- Multiple linear regression, quantile regression, and correlation
- Model building and selection
- Interpreting regression coefficients and confidence intervals
- Quantifying and dealing with multicollinearity
- 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
- Testing the linearity assumption
- 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. 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 this course, please email the syllabus of the statistics course that you completed to Dr. Silva-Lugo, and he will let you know whether you can enroll.

SPSS Statistics Essential Training in LinkedIn Learning

Participants are encouraged to take the LinkedIn Learning training named "SPSS Statistics Essential Training" (10 chapters except factor analysis and principal component analysis, reliability analysis, and all topics of Chapter 7) before the course starts. This course is a good introduction to SPSS, and it will facilitate the learning experience with the Statistical Package for the Social Science and Sample Power 3 course. To access this course, go to e-Learning, click and login in LinkedIn Learning, and type the title of the course in the search box field.

SPSS Textbooks

Below is the most current list of textbooks in SPSS. Kerr's book follows the same structure of research methodology used in this course.

- Aldrich, J. O. and J. B. Cunnigham. 2015. Using IBM SPSS Statistics: An interactive hand-on approach. 2nd Edition. SAGE Publications, Washington DC, USA.
- Cronk, B. C. 2017. How to use SPSS: a step-by-step guide to analysis and interpretation. 9th Edition. Routledge, New York, USA.
- Denis, D. 2019. SPSS Data Analysis for Univariate, Bivariate and Multivariate Statistics. John Wiley & Sons, Inc. Hoboken, NJ.
- Field, A. P. 2018. Discovering Statistics using SPSS (Introducing Statistical Method). 5th Edition. SAGE Publications Ltd., California, USA.
- George, D. and P. Mallery. 2018. SPSS Statistics 23 Step-by-Step: A Simple Guide and Reference 15th Edition. Routledge, New York, USA.
- Green, Samuel B. and Neil J. Salkind. 2016. Using SPSS for Windows and Macintosh: Analyzing and Understanding Data. 8th Edition. Pearson, New York, USA
- Ho, Robert. 2014. Handbook of Univariate and Multivariate Data Analysis and Interpretation with SPSS. 2nd Edition. CRC Press, Boca Raton, Florida, USA.
- Kerr, A. W., H. K. Hall., and S. A. Kozub. 2014. Doing Statistics with SPSS. SAGE Publications, California, USA.
- Leech, Nancy L.; Karen C. Barrett; and George A. Morgan. 2014. SPSS for Intermediate Statistics: Use and Interpretation. 5th Edition. Routledge, New York, USA.

- Maujis, D. Doing Quantitative Research in Education with SPSS. 2nd Edition. SAGE Publications, California, USA.
- McCormick, K., J. Salcedo, J. Pock, and A. Wheeler. 2017. SPSS Statistics for Data Analysis and Visualization. John Wiley & Sons, Inc. Indianapolis, IN.
- Wagner, W. E. 2016. Using IBM SPSS Statistics for Research Methods and Social Science Statistics. 6th Edition. SAGE, California, USA.
- Wilson-Doenges, G. 2014. SPSS for Research Methods: A Basic Guide. John Willey and Sons, New York, 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.

- Field, A. P. 2018. Discovering Statistics using SPSS (Introducing Statistical Method). 5th Edition. SAGE Publications Ltd., California, USA.
- Ramsey, F. and D. W. Schaefer. 2013. The Statistical Sleuth: A Course in Methods of Data Analysis. 3rd Edition. Brooks/Cole, Cengage Learning, USA.

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. **Your participation is critical to successfully complete the course because this is a fast paced, intensive hands-on, 9-week course on elementary statistical analysis**.

Please, allow me to explain what participation means. If you are interested in this course, you must follow the workflow: take the background knowledge survey, study the tutorial and other resources, watch the videos, and do the tutorial and skill activities. If you have time, it is strongly recommended to 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 fail to follow the workflow and do not have a score equal or greater than 80 points in the tutorial and skill activities.

Getting to Class

This is an online course implemented though the course management system "Canvas" at the University of Florida. Since the course is self-paced, you are in control of the time spent in each module. You can access a Module by clicking on Home and selecting the topic taught in that module or you can go to the Modules tool in the Navigation Bar. Each module has background

knowledge, resources, objectives, learning materials, activities (tutorial and skill) with feedback, and optional exercises. 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 workflow, you guarantee your learning. **The course will open on January 16th at 8:00 am and will end on March 15th at 5:00 pm.** The course can be completed in seven weeks, but two more weeks are given to allow participants more time for completion. **No extension will be offered!**

Course Evaluation and Certificate

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.

If you read the tutorial and watch the videos, you will have enough information to carry out successfully the tutorial and skill activities. Each module has additional references if you are interested to obtain more information. **You will be able to read the tutorial online, but you will not be able to download it or to print it.**

I will evaluate your knowledge, skills, and your level of satisfaction. Knowledge and skills will be assessed by using the tutorial and skill activities, respectively. Both evaluations will be scored in Canvas automatically. You will also have the opportunity to evaluate the course with a satisfaction survey at the end of the course. If you want to work in teams, you are welcome to do so. Please, notify me if you are creating a group.

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. I am sure that your classmates will answer those questions to help you out to move on in your workflow.

This course will give you the tutorial and a certificate if you participate in the seven modules and obtain a passing score equal or greater than 80% as your final grade in Canvas. The tutorial is a book in pdf format that I wrote down with the only purpose to be given to students who pass the course. The 3rd edition was published in November 2021.

Cheating or lying in any form will not be tolerated. If you are caught under any of these inexcusable behaviors, you will be dismissed from the course.

Grades and Grading Scheme

The tutorial and skill activities will have a weight of 40% and 60%, respectively.

The Grading Scheme is as follows:

Score	From (%)	To (%)
A	100	94.0
A-	<94.0	90.0
B+	<90.0	87.0
B	<87.0	84.0
B-	<84.0	80.0
C+	<80.0	77.0
C	<77.0	74.0
C-	<74.0	70.0
D+	<70.0	67.0
D	<67.0	64.0
D-	<64.0	60.0
E	<60.0	0.0

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

Accommodation for Students with disabilities

If you need classroom accommodation because of a disability, you must register with the Disability Resource Center. 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 workflow and for studying all materials and resources posted within the course in Canvas.
- You are responsible for submitting all activities in Canvas.
- The course starts on 01/16/2024 (8:00 am) and ends on 03/15/2023 (5:00 pm). Therefore, plan well your daily work to make sure that you can successfully complete this course. No extension will be given under any circumstances.
- 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.29 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.29 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 at 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