

International Summer School Manipal University Jaipur [ISSMUJ]-2022

[Hybrid Mode]

Course Overview

Name of Course: Univariate and Multivariate Data Analysis with SPSS

Name of instructor: Dr Ashish Kumar, Dr. Monika Saini

Session: June 2022

Language of instruction: English

Number of contact hours: 36

Credit awarded: 03

Objective of Course

The main objective of the course is to assist the student in learning to think deeply and critically about establishing research problems comprised of univariate and multivariate data sets. Large amount of data is collected on many different variables across disciplines in order to understand the underlying process(es). With the availability of inexpensive, fast and efficient computing resources and statistical packages there has been a growth in the application of these techniques. The objectives include:

- understanding univariate and multivariate analysis
- learning how to properly screen variables prior to analysis
- learning several techniques for analyzing univariate and multivariate data
- learning how to employ the SPSS program for these techniques.

Syllabus

Review of univariate and bivariate Statistics, gaining familiarity with SPSS, Screening of Data Prior to Analysis, Scale of Measurement, Graphical representation of data, Measures of central tendency, Dispersion, Skewness and Kurtosis, Normality, Correlation, simple regression, t-tests: Comparing two means with a continuous dependent variable, Chi-square: Single and two-group comparisons when the dependent variable is dichotomous, One-way ANOVA and follow-up tests, Factorial ANOVA, and simple effects. Review of ANOVA/ANCOVA, Multivariate Analysis of Variance (MANOVA/MANCOVA), Principal component analysis, factor analysis, cluster analysis, correspondence analysis, multidimensional scaling. Multiple regression models, logistic regression, canonical correlation, discriminant analysis.

Organization of course

Total contact hrs 36		
1st week:	10 hrs (classes)	2 hrs (self-study/project)
2nd week:	10 hrs (classes)	2 hrs (Mid term exam/assessment/discussion)
3rd week:	10 hrs (classes)	2 hrs (End term exam)

Mode of lectures: online lecture/online videos/case study/ discussion/ workshop/ hands-on

Course Plan

Lecture no.	Topic	Lecture mode	Instructor
L: 1-6	Review of univariate and bivariate Statistics, Gaining familiarity with SPSS, Screening of Data Prior to Analysis, Scale of Measurement, Graphical representation of data, Measures of central tendency, Dispersion, Skewness and Kurtosis, Normality, Correlation, simple regression,	Online Lecture and Discussion	Dr. Monika Saini
L: 7-12	t-tests: Comparing two means with a continuous dependent variable, Chi-square: Single and two-group comparisons when the dependent variable is dichotomous	Online Lecture and Discussion	Dr. Monika Saini
L: 13-18	One-way ANOVA and follow-up tests, Factorial ANOVA and simple effects.	Online Lecture and Discussion	Dr. Monika Saini
L: 19-24	Review of ANOVA/ANCOVA, Multivariate Analysis of Variance (MANOVA/MANCOVA), Principal component analysis,	Online Lecture and Discussion	Dr. Ashish Kumar
L: 25-30	factor analysis, cluster analysis, correspondence analysis, multidimensional scaling.	Online Lecture and Discussion	Dr. Ashish Kumar
L: 31-36	Multiple regression models, logistic regression, canonical correlation, discriminant analysis.	Online Lecture and Discussion	Dr. Ashish Kumar

Brief profile of the instructor

Dr. Ashish Kumar received the M.Sc., M.Phil., and Ph.D. degrees in 2009, 2010, and 2013, respectively. He got gold medal in M.Sc. (Statistics) and M.Phil. (Statistics). He is the recipient of INSPIRE Fellowship. He is currently working with the Department of Mathematics and Statistics, Manipal University Jaipur, Jaipur, India, as an Assistant Professor. He has more than 12 years of research experience and teaching experience. His research interests include reliability modelling, reliability estimation, and sampling theory. He published more than 110 research papers in SCI/SCOPUS/WoS/UGC/ABDC journals, and 05 patents are granted. Two students awarded Ph.D. degree under his supervision and 04 are currently working. Several UG /PG students completed their projects under his guidance. He is the life member of several academic bodies and joint secretary of Indian Association of Reliability and Statistics. He is the assistant editor of International Journal for Statistics and Reliability Engineering.



Dr. Monika Saini received the M.Sc., M.Phil., and Ph.D. degrees in 2008, 2009, and 2012, respectively. She is currently working with the Department of Mathematics and Statistics, Manipal University Jaipur, Jaipur, India, as an Assistant Professor. Her research interests include reliability modelling, reliability estimation, and sampling theory. She has published more than 70 research papers in SCI/SCOPUS/WoS/UGC/ journals, and 04 patents are granted. One student awarded Ph.D. degree under her supervision and 04 are currently working. Several UG /PG students completed their projects under her guidance.

