

International Winter School- Manipal University Jaipur [IWSMUJ]-2023



[Hybrid Mode]

Course/Project Overview

Name of Course/Project -Hands on Analysis of Biological Data using SPSS/R

Name of instructor: Dr. Vaibhav Bhatnagar, Dr. Linesh Raja, Dr. Nikita Sharma

Session: Jan.-Feb. 2023

Language of instruction: English

Number of contact hours: 36

Credit awarded: 03

Objective of Course/Project

- To understand the basic concepts of data analysis in Biological Field
- To implement correlation, regression on biological data
- To understand the concept of test the hypothesis
- Understanding Advance Biological data analysis

Syllabus:

Data representation and plotting, measures of central tendency, Measure of Variability, Standard deviation, SME, Z-Score, Box plot, Correlation, Regression, Interpolation and extrapolation, Nonlinear data fitting, T test, Z-test, ANOVA Family, Chi-square test. Survival Analysis, Kaplan–Meier curves, Hazard function, Cox proportional hazards regression. ROC Curve Analysis. Sample Size calculation using G Power. Model development of X ray Images for identifying the disease.

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
4 th week:	6 hrs (Classes)	2hrs (End term exam)

Mode of lectures: Hybrid mode lecture and hands-on

Course/Project Plan

Lecture no.	Topic	Lecture mode	Instructor
L: 1-3	Introduction to Subject, Types of Data, understanding Biological Data	Online/ Offline	Dr. Linesh Raja/Dr. Nikita Sharma
L: 4-5	Measure of central tendencies and measures of variations	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L: 6-7	Plotting of Data	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L: 8-11	Correlation and Regression analysis	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L:12-13	Interpolation and extrapolation, Nonlinear data fitting	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L:14-15	Basic Concepts of Hypothesis Testing	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L: 15-19	Parametric Tests	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L:20-21	Non Parametric Tests	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L: 22-25	Survival Analysis	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L: 26-30	ROC Analysis	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L: 31-34	Sample Power Calculation	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma
L: 35-36	Model development of X ray Images for identifying the disease.	Online/ Offline	Dr. Vaibhav/Dr. Nikita Sharma

Brief profile of the instructors

1. Dr. Vaibhav Bhatnagar



Dr. Vaibhav Bhatnagar is working as an Assistant Professor (Senior Scale) in the Department of Computer Applications, Manipal University Jaipur. He achieved Gold Medal in Graduation, Silver Medal in Post-Graduation. He is one of the youngest persons who completed their Ph.D. in Information Technology in Rajasthan. His current google citation is 250. His research interests are in the field of Data Science and Machine Learning. He has expertise in R, Orange, Tableau and Medcalc. He has published more than 20 research papers in SCI, Scopus, Web of Science, etc indexed Journal. He has also completed and submitted research projects funded Department of Science and Technology. He is also supervising Ph.D. Scholars

2. Dr. Linesh Raja



Linesh Raja is currently working as an Associate Professor at the Department of Computer Applications, Manipal University Jaipur, India. Altogether he has 13 years of teaching and research experience. In the year 2021, he has completed one DST-SERB Matrix-funded project in the capacity of co-investigator. He earned a Ph.D. in computer science in the year 2015 from JNU, Jaipur. Before that, he completed his master's and bachelor's degree from Birla Institute of Technology, Mesra, Ranchi, India. Dr. Linesh has published several research papers in the field of Medical imaging, Wireless communication, Mobile network security, and the Internet of things in various reputed national and international journals. He has chaired various sessions of international conferences. He has also edited a Handbook of Research on Smart Farming Technologies for Sustainable Development, IGI Global. At the same time, he is also acting as a guest editor of various reputed journal publishing houses, such as Taylor & Francis, Inderscience, and Bentham Science.

3. Dr. Nikita Sharma



Dr. Nikita Sharma is working as Assistant Professor in Department of Community Medicine, Mahatma Gandhi Medical College and Hospital. She has completed her Post Graduation from SMS Medical College, Jaipur Rajasthan. She has keen interest in research and has many publications in different journals. Her key contributions are Seasonal trend of Dengue cases admitted in a tertiary Hospital: A record based study, Prevalence of substance abuse among students of SMS Medical College Jaipur, Assessment of knowledge and practice regarding menstrual hygiene among school going adolescent girls of Jaipur city, A comparative study of knowledge and practice regarding menstrual hygiene among private and government schools of Jaipur city, To study epidemiological profile of dog bite cases attending anti rabies centre at SMS Hospital, Jaipur and pretreatment practices adopted by them following animal bite and An epidemiological study of Tetanus cases in a tertiary care hospital of Jaipur.