

DISCIPLINE SPECIFIC ELECTIVE COURSE -20

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course title & Code	Credits	Credit distribution of the course			Eligibility criteria	Pre-requisite of the course (if any)
		Lecture	Tutorial	Practical/ Practice		
DSE 20 Statistical Techniques Using Software Tools	4	3	Nil	1	Class XII Passed	

Learning Objectives

- To familiarize students with advanced statistical methods applicable to psychological research.
- To orient students to conduct data analysis utilizing statistical software applications.
- To equip students to interpret and present statistical findings.
- To encourage critical thinking and the capability to assess the suitability of statistical methods for particular research inquiries.

Learning outcomes

The Learning Outcomes of this course are as follows:

By studying this course, students will be able to:

- Utilize software tools to perform statistical analyses.
- Interpret and report results of statistical analyses.
- Employ statistical techniques in psychological research.
- Evaluate the statistical methods and outcomes presented in published studies.

Syllabus DSE 20

UNIT – I: Basics of Quantitative analysis

(10 hours)

Data Cleaning, Missing values, Normalcy of data, Sample size estimation, Power and Effect size

UNIT – II: Analysis of Variance

(12 hours)

Repeated measures ANOVA; Introduction to Factorial Designs: 2-way ANOVA, ANCOVA, MANOVA

UNIT – III: Correlation and Regression Analysis

(13 Hours)

Correlation methods (point biserial, biserial, tetrachoric and Phi), Partial and Multiple correlation; Multiple regression, logistic regression; Introduction to Mediation and Moderation analysis; Interpretive aspect of correlation and regression

UNIT – IV: Non-Parametric Statistics

(10 Hours)

Mann-Whitney Wilcoxon test, Wilcoxon signed-rank test, Kruskal-Wallis one way ANOVA and Friedman test; Applications of non-parametric methods in psychological research.

Tutorial Component- Nil

Practical component: (30 hours)

- Hands-on data analysis using software such as Jamovi, SPSS, R, or Python.
- Sample size estimation, Power and Effect size using G* Power.
- Conducting statistical tests and interpreting results.
- Report writing and presentation of analysis outcomes using APA format.

Essential/recommended readings:

Aron, A., Aron, E. N., & Coups, E. J. (2022). *Statistics for Psychology* (7th ed.). Pearson.

Broota, K. D. (1990). *Experimental design in behavioural research*. Wiley.

Dugard, P., Todman, J. B., & Staines, H. (2010). *Approaching multivariate analysis: A practical introduction* (2nd ed.). Routledge.

Field, A. (2017). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.

Hinton, P. R., McMurray, I., & Brownlow, C. (2014). *SPSS explained* (2nd ed.). Routledge.

King, B. M., & Minium, E. W. (2007). *Statistical Reasoning in the Behavioral Sciences* (5th ed.). Wiley.

Mayers, A. (2013). *Introduction to statistics and SPSS in psychology*. Pearson.

Suggestive readings:

Garrett, H. E. (2014). *Statistics in Psychology and Education* (6th ed.). Surjeet Publications.

Mangal, S. K. (2002). *Statistics in Psychology and Education* (2nd ed.). Prentice Hall India Learning Private Limited.

Rust, J., Kosinski, M., & Stillwell, D. (2020). *Modern psychometrics: The science of psychological assessment* (4th ed.). Routledge.

Suggestive Softwares:

- <https://www.jamovi.org/>
- <https://www.psychologie.hhu.de/arbeitsgruppen/allgemeine-psychologie-und-arbeitspsychologie/gpower>

Note: Examination scheme and mode shall be as prescribed by the Examination Branch, University of Delhi, from time to time.