**PSY-105 INFERENTIAL STATISTICS & SPSS**

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| Resource Person: | Beenish Mubeen | |
| Email: | [beenish.mubeen@umt.edu.pk](mailto:beenish.mubeen@umt.edu.pk) | |
| School & Department | School of Professional Psychology | Department of Applied Psychology |
| Consultation Hours | Thursday 12:30 – 3:30 pm; Friday 12:00– 01:00 pm | |
| Degree Program: | BS | |
| Section: | A | |
| Semester: | S2023 | |
| Course Pre-requisite(s): | Introduction to Statistics | |
| Credit Hours: | 4 | |
| Course Type: (Theory/Lab) | Lab | |
| Venue/Day/Time: | Saturday 08:00am-11:00am | |
| Course URL (if any): | - | |

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| 1. **Faculty Profile / Introduction** |
| Academically, she is PhD Scholar at Institute of Applied Psychology, University of the Punjab, Lahore. She has Done her Masters in Clinical Psychology from Government College University, Lahore. She is a Dedicated Psychology Teacher who believes that every student must understand the importance of psychology in their everyday lives. As well as teaching undergraduate and postgraduate students, her research interests focus on Clinical Psychology, Social Psychology, Health Psychology & Forensic Psychology.  She is engaged in Teaching and Research for about more than seven years. She worked as Head of Psychology Department at Cantonment Board Post Graduate College for two years and overall five years of Teaching Experience and five years of Clinical Experience. She joined University of Management and Technology in 2020, she is extremely passionate to work with a dynamic organization. During this period, she has been working on quality teaching and research in the institution. Till now, she has supervised 13 BS and 4 MPhil theses. She has eight publications in International and National HEC-recognized journals. Talking about professional development, she has attended various training workshops. She is skilled to design customized course curriculums by introducing interactive courses. |

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| 1. **Course Description:** |
| This course is designed for BS students to acquire an understanding of inferential statistics and their practical applications in research. The course will cover the fundamental concepts of inferential statistics, including hypothesis testing, confidence intervals, and estimation of population parameters.  The course will also introduce students to SPSS (Statistical Package for the Social Sciences) software, a widely used tool for statistical analysis. Students will learn to perform various statistical analyses using SPSS, including descriptive statistics, t-tests, ANOVA, correlation analysis, and regression analysis etc.  The course will provide students with hands-on experience in applying inferential statistics and SPSS techniques to real-world data sets. The course will also emphasize the interpretation of statistical results, helping students develop the skills needed to effectively communicate statistical findings. |

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| 1. **Course Teaching Methodology:** |
| The course is designed to be interactive and engaging, with a combination of lectures, Discussion, hands-on exercises, and group projects. |

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| 1. **Program Educational Objectives (PEOs):** | |
| PEO-1 | Graduate will be able to describe and apply concepts and theories relevant to the disciplines of psychology. |
| PEO-2 | Graduate will demonstrate effective written and oral skills in various formats |
| PEO-3 | Graduate will be able to conduct and evaluate research addressing psychology related issues. |
| PEO-4 | Graduate will demonstrate ethical behavior in all aspects of psychology. |
| PEO-5 | Graduates will exhibit a life-long learning approach towards life with psychological science |

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| 1. **Program Learning Outcomes (PLOs):**   **After completing this degree program, students shall be able to:** | | |
|  | | **Mapping the PLOs with PEOs** |
| PLO-1 | **Psychology Knowledge:** The students will have a good knowledge and understanding of the subject and its implication in different areas and to apply knowledge of Psychology to both theoretical and practical social problems. | **PEO1** |
| PLO-2 | **Communication:** The students will demonstrate effective verbal and written skills. Able to communicate mindfully and respectfully to individuals and professionals of diverse ethnic, religious, and cultural backgrounds. An ability to communicate effectively, orally as well as in writing, on various social events held by the Psychologists’ community, including conferences, seminars, workshops etc. | **PEO2** |
| PLO-3 | **Research:** An ability to identify, formulate, search literature, and analyze complex social and psychological problems reaching substantiated conclusions using ethical principles related to its sub-fields. | **PEO3** |
| PLO-4 | **Ethics:** Apply ethical principles to practice psychology in the community. Understanding about ethical practice and best practices as psychologists. | **PEO4** |
| PLO-5 | **Life-Long Learning:** Able to develop significant professional goal for life after being graduate. An ability to recognize the importance of psychology and its implacability in their personal and professional lives. | **PEO5** |

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| 1. **Course Objectives (COs)** | |
| CO-1 | To learn the connection between theory, methods, and statistics. |
| CO-2 | To provide hands-on experience in applying inferential statistics and SPSS techniques to real-world data sets. |
| CO-3 | To develop students' skills in interpreting statistical results and drawing meaningful conclusions from data. |
| CO-4 | To teach students how to effectively communicate statistical findings in written and oral formats. |
| CO-5 | To promote the use of ethical practices in the collection, analysis, and reporting of statistical data |

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| 1. **Course Learning Outcomes (CLOs):**   **After completing this course, students shall be able to:** | | |
|  | | **Mapping the CLOs with PLOs** |
| CLO-1 | Understand how research is related with the statistical procedures | PLO1 |
| CLO-2 | Perform basic and advanced statistical analyses using SPSS software. | PLO1 |
| CLO-3 | Demonstrate proficiency in interpreting statistical results and drawing meaningful conclusions from data. | PLO3 |
| CLO-4 | Communicate statistical findings effectively in written and oral formats. | PLO2, |
| CLO-5 | Apply ethical practices in the collection, analysis, and reporting of statistical data. | PLO-4 |

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| 1. **Assurance of Learning and Assessment Items:**   *Specify Assessment Items that will assure student learning through application and achieve objectives of specific PLOs / CLOs* | |
| **Assessment Item** | **Application/ Objectives**  **PLO / CLO** |
| Assignment 1 | **CLO1/PLO1** |
| Assignment 2 | **CLO3/PLO3** |
| Assignment 3 | **CLO4/ PLO2** |
| Assignment 4 | **CLO5/ PLO4** |
| Project | **CLO2/ PLO1** |
| Quiz 1 | **CLO1 / PLO1** |
| Quiz 2 | **CLO3 / PLO3** |
| Quiz 3 | **CLO4 / PLO2** |
| Quiz 4 | **CLO5/ PLO4** |
| Mid Term Exam | **CLO1, CLO2, CLO4/ PLO1, PLO2, PLO3** |
| Final Exam | **CLO2, CLO3, CLO5/ PLO1, PLO3, PLO4,** |

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| 1. **Assessment Structure and Grading Policy\*:** | | |
| **Assessment Item(s)** | **Weight (%)** | **When will be assessed** |
| Quiz | 10 | Once every two weeks |
| Assignments | 10 | Once every two weeks |
| Project | 15 | One-time assessment |
| Mid-term exam | 25 | One-time assessment |
| Final exam | 40 | One-time assessment |
| **Total** | **100** |  |
| **Notes – Norms and Important Class Policies:**  *(such as submission guidelines, academic honesty, make-up policy, code of conduct)*   * Attendance below 80% will result in Short-Attendance grade. The participant will not be allowed to sit in the final examination. * All assignment submission is subject to plagiarism check. Plagiarism score above 19% will render the submission void. * There is no provision for make-up exam, mid-term exam, quizzes and assignments for any reason whatsoever. | | |

*\*Rubrics for all assessments (including mid and final exams) will be provided separately to the students.*

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| 1. **Weekly Sessions Plan:** | | | |
| **Week** | **Topics / Contents** | **Activity** | **Application/Objectives**  **PLO / CLO** |
| 1 | Introduction to Statistics  Descriptive and inferential statistics  Variables (IV, DV, Continuous variable, discrete variable etc.)  Scales of Measurement (Nominal, Ordinal, Interval, Ratio)  Measures of central tendency &dispersion  Properties of normal distribution | Lecture, Discussion, Assignment 1 | **CLO1/PLO1** |
| 2 | **Sample Distribution**  Sampling Error  Distribution of Sample Means  Characteristics of Sampling Distribution | Lecture, Discussion | **CLO1/PLO1** |
| 3 | **Hypothesis Testing**  Hypothesis formulation: Null and Alternative  Hypothesis  One tailed & two tailed hypotheses tests.  Hypothesis testing: A four step approach  Level of significance: acceptance and rejection  Regions  Errors in hypothesis testing  Power analysis  Parametric and nonparametric analyses | Lecture, Discussion, Quiz 1 | **CLO2/ PLO1** |
| 4 & 5 | **Introduction to IBM SPSS**  Creating Data Sheet  Data Entry, Data View, Variable View  Assigning variables names and value labels  Recoding and Computing Data  Split files, select cases, sort cases, Utilities  Screening the data:   * Dealing with Missing values, * Detecting Outliers * Manipulating data * Computation of scores | Lecture, Discussion, Assignment 2 | **CLO2/ PLO1** |
| 6 | **Exploring Data with Graphs**  Histogram  Boxplot  Pie Chart  Scatterplot  Bar chart | Lecture, Discussion,  Practical | **CLO3/ PLO3** |
| 7 | **Assumptions of Parametric Testing**  Normality  Homogeneity of Variance  Linearity  Independence | Lecture, Discussion, Assignment 3 | **CLO2/ PLO1** |
| 8 | **Descriptive statistics**  Frequency Distribution  Measure of Central Tendency  **Reliability Analysis** | Lecture, Discussion, Practical, Quiz-2 | **CLO3/ PLO3** |
| 9 | **MIDTERM** |  | **CLO1, CLO2, CLO4/ PLO1, PLO2, PLO3** |
| 10 | **Correlation**  Bivariate correlation  Pearson correlation coefficient  Spearman’s correlation coefficient (Non-parametric)  Kendall’s correlation coefficient  Point-biserial correlation  Biserial correlation Partial correlation  Semi-partial correlation  Reporting according to APA7 | Lecture, Discussion, Practical  Project | **CLO4/ PLO2** |
| 11 | **Regression**  Linear Regression  Multiple Regression  Methods of Regression (Enter method, Step wise method, Forward Method, Backward method)  Reporting according to APA7 | Lecture, Discussion, Practical, Quiz-3 | **CLO3 / PLO3** |
| 12 | **Comparing Two Means**  One-sample t-test  Independent Sample t-test  Paired Sample t-test  Effect Size and Cohens’s d  Reporting according to APA7 | Lecture, Discussion, Practical | **CLO3/ PLO3** |
| 13 | **Comparing Several Means**  One way Analysis of Variance (ANOVA)  Repeated measure ANOVA  Post Hoc tests  Effect Size & Power Analysis  Factorial ANOVA  Reporting according to APA7 | Lecture, Discussion, Assignment 4 | **CLO4/ PLO2** |
| 14 | **Non-Parametric Tests**  The Mann-Whitney test  Wilcoxon’s signed rank test  Kruskal-Wallis ANOVA on ranks  Friedman’s rank test on correlated samples  Goodness of fit  Analysis of contingency tables  Revision | Lecture, Discussion, Practical, Quiz-4 | **CLO3/ PLO3** |
| 15 | **REVISION** | | |
| 16 | **FINAL TERM EXAM** | | **CLO1, CLO2, CLO3, CLO4/ PLO1, PLO2, PLO3, PLO4** |

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| 1. **Primary Text Book (s):** |
| * Field, A. (2017). Discovering statistics using IBM SPSS statistics (5th ed.). SAGE   Publications.   * Pallant, Julie. (2016). SPSS survival manual : a step by step guide to data analysis using SPSS. Maidenhead : Open University Press/McGraw-Hill. |

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| 1. **Reference / Supplementary Reading (s):** |
| * Brace, N., Kemp, R., &amp; Snelgar, R. (2006). SPSS for psychologists. London Lawrence   Erlbaum Association.   * Gravetter, F., &Wallnau, L. B. (2002).*Statistics for the Behavioral Sciences,* (10th ed.). USA: Wadsworth, Cengage Learning * Howell, D. C. (2007). *Statistical methods in psychology* (6thed.). Australia: Thomson Wadsworth. * Kline, R, B. (2011). *Principles and Practice of Structural Equation Modeling* (3rded.). US: Guilford Press. |

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| 1. **Useful Online / Web Resources:** |
| <https://statistics.laerd.com/>  <https://www.youtube.com/@infoedures/featured> |