LEAD CITY UNIVERSITY

Faculty of Social and Management Sciences

Department of Sociology and Psychology

COURSE PARTICULARS

Course Code: PSY 414
Course Title: Statistical Methods in Psychology
No. of Units: 3
Status: Compulsory

LECTURER DETAILS

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Area of Specialization: Clinical Psychology

COURSE DESCRIPTION

This course presents the broader outlook of statistical methods in psychology which is the basic knowledge of statistical methods in behavioral science. On the course, students are expected to learn: introduction to parametric and non-parametric statistic, descriptive and inferential statistic, scales of measurement, correlation analysis, analysis of variance (ANOVA), factorial analysis. Other included topics are multiple comparison, Kruskal Wallis H Test and Kolmogorov Smirnov test, some principles of regression, regression analysis, and introduction to the use and application of Statistical Package for Social Sciences (SPSS).

COURSE OBJECTIVES

To expose the students to statistical methods in psychology through various topics like:
Types and forms of statistics, scales of measurement, correlation analysis, Kruskal Wallis Test
Analysis of variance, factorial analysis, multiple comparisons, regression analysis.
Introduction to the use and application of statistical package for social sciences (SPSS).

ASSESMENT

- Class Attendance 5 marks
- Test and Assignment 25 marks
- Final Examination 70 marks

LECTURE PLAN

Week	Topic
Week 1	**Introduction to Parametric and Non-parametric Statistic:** Definitions, types, assumptions, advantages and disadvantages.
Week 2	**Descriptive and inferential statistic**: Introduction (Definitions), Types, Assumptions.
Week 3	**Scales of Measurement:** Ordinal Scale of Measurement, Nominal Scale of Measurement Interval Scale of Measurement, Ratio Scale of Measurement.
Week 4	**Correlation Analysis:** Simple Correlation, Spearman Rank Order Correlation, Bi-serial and Point Bi-serial Correlation Analysis.
Week 5	**Correlation Analysis:** Partial Correlation Analysis, Multiple Correlation.
Week 6	**Analysis of Variance (ANOVA):** One-Way ANOVA for completely randomized design, One-Way ANOVA for repeated measure design
Week 7	**Factorial Analysis**: Two-way ANOVA, Three-way ANOVA
Week 8	**Multiple Comparison:** Protected T-Test, Least Significant Differences
Week 9	Kruskal Wallis H Test and Kolmogorov Smirnov test
Week 10	**Some Principles of Regression**: B =Unstandardized Regression coefficient, β=Standardized Regression Coefficient, R, R Square, Adjusted R Square, Multicollinearity.
Week 11	**Regression Analysis:** Simple Regression, Multiple Regression
Week 12	Introduction to the use and application of Statistical Package for Social Sciences (SPSS). Familiarity with Terminologies, Coding and Scoring, Result and Interpretation, a**nd Summary**

READING LIST

Alarape, A.I. (2005). Statistical Methods and Computer Application, in B. Udegbe,S. Balogun,H. Osinowo and G. Sumola (eds). *Psychology: Perspectives in human Behaviour*. Ibadan, Department of Psychology, University of Ibadan. (Chapter 3), 59-88

Dunn, D.S.(2001). Introduction to Statistics and Data Analysis as tool for Researchers, *Statistics and Data Analysis for the Behavioural Sciences* (Chapter 1), 3-43

Miler, R.G (1981). Simultaneous Statistical Inference 2nd Ed.Springer Verlag New York.

TUTORIAL QUESTIONS

Question 1

Write short notes on the following scales of measurements

1. Ordinal Scale of Measurement
2. Nominal Scale of Measurement
3. Interval Scale of Measurement
4. Ratio Scale of Measurement

Question 2

With assumptions and Advantages differentiate between the two statistics

A. Parametric and Non-parametric Statistic
B. Descriptive and inferential statistic

Question 3

Mr BE wants to correlate the relationship between gender and the scores obtained from sociability. He intended to test the hypothesis with 0.05 level of significant (one tailed)

Using the below figures:

1. State the title of the research
2. State directional hypothesis
3. State reasons for the choice of statistics
4. Test the Hypothesis
5. State the behavioural and statistical conclusion

Sn	Gender (Y)	Sociability scores(X)	X^2
1	F	7	49
2	M	4	1
3	F	3	9
4	F	5	25
5	M	9	81
6	M	1	1
7	M	9	81
8	F	10	100
Total		$\sum X=48$	$\sum x^2=362$

Question 4

A researcher is interested in the association among age, academic performance and socio economic status of final year students of sociology and psychology department of Lead City University Ibadan. Using the table below:

Sn	Age (X)	Acad.Perf. (Y)	Soc.Eco.Stat. (Z)	X^2	Y^2	Z^2	XY
1	22	3.5	40	484	12.25	1600	77
2	26	2.9	35	676	8.41	1225	75.4
3	23	3.60	60	529	12.96	3600	82.8
4	30	3.2	55	900	10.24	3025	96
5	20	3.56	70	400	12.67	4900	71.2
Total	**$\sum X=$**	**$\sum Y=$**	**$\sum Z=$**	**$\sum X^2=$**	**$\sum Y^2=$**	**$\sum Z^2=$**	**$\sum XY$**

1. State the title of the research
2. State a non-directional hypothesis
3. Test Hypothesis at 0.05 level of significant
4. State reasons for the choice of statistics
5. State a behavioural and Statistical Conclusion

Question 5

A final year student of Lead City University Ibadan did a research on the effect of Water (H_20) on bedwetting. She randomly selected Six (6) infants whose age ranged between 5years and 9years with SD=2.76. Bedwetting is measure in numbers of times individual bed wet in two weeks. Using the figures below

A. State the title of the research
B. Formulate a non-directional Hypothesis
C. Test the hypothesis at 0.05 level of significant
D. State reasons for choice of statistics
E. State the behavioural and statistical conclusion

SN	L_1=A (1 litres)		L_2=B (4litres)		L_3=C (7litres)	
	A	A^2	B	B^2	C	C^2
1	4	16	28	784	17	289
2	0	0	27	729	25	625
3	0	0	10	100	9	81
4	15	225	8	64	32	1024
5	2	4	5	25	37	1369
6			32	1024	60	3600
Total	$\sum X_A=$	$\sum X^2_A=$	$\sum X_B=$	$\sum X^2_B=$	$\sum X_C=$	$\sum X^2_C=$

Question 6

A four hundred level student of Psychology, Lead City University Ibadan, investigated the extent to which Nigeria driver were prepared to face the driving challenges normally experienced in the month of December. Specifically, she tested the influence of Age Category of Drivers (A: Adolescence, Young Adult and Old Adult) and Gender(B: Male versus Female) on driving intentions (DI) of licensed drivers in Nigeria. She randomly selected 60 licensed drivers whose ages ranged between 18 and 62 years (Mean age 34.25years, SD=11.20) in such a way that equal numbers of males and females represented each age category of drivers. After a 14-day sensitization programme, the participants completed a 15-item Driving Intention Questionnaire (DIQ). DIQ was scored on a 4-point scale (0=Not likely, 4=Extremely likely). High score in DIQ indicated that the respondent would be able to cope with demanding driving conditions. The score are presented below.

SN	Adolescents		Young Adults		Old Adults	
	Male	Female	Male	Female	Male	Female
1	2	3	3	3	6	7
2	3	3	4	4	7	6
3	4	2	2	5	8	3
4	5	10	1	3	9	4
5	2	6	1	4	4	3
6	3	3	2	7	5	6
7	1	4	3	6	5	5
8	2	3	4	5	6	4
9	3	4	5	3	2	4
10	3	2	2	3	2	3

a. State the title of the research. b. Formulate non-directional hypothesis.
c. Test hypothesis at 0.05 level of significant. d. Give reasons for choice of statistics.
d. State your conclusion

Question 7

With assumptions, advantages and formula differentiate between Protected T-Test and Least Significant Differences

Question 8

With assumptions, advantages, limitations and formula differentiate between Kruskal Wallis H Test and Kolmogorov Smirnov test.

Question 9

Write short notes on the following

(1).B (**2**).β (**3**). R Square (**4).** Adjusted R square. (**5**). t (**6**). r **(7).** F **(8).** P (**9).** Sig (**10).** Df

Question 10

Mr. O is interested on whether the student's calculation ability (X) could predict good performance in statistical methods in Psychology. Using the below table

(a). State the title of the research. (b). Formulate non-directional hypothesis

(c). Test the hypothesis at 0.05 level of significance. (d). State the reason for choice of your statistics. (e). State the statistical and behavioural conclusion

SN	X	X^2	Y	Y^2	XY
1	42	1764	80		3360
2	50	2500	50		2500
3	45	2025	62		2790
4	60	3600	80		4800
5	31	961	42		1302
6	45	1849	51		2193
7	35	1225	40		1400
8	41	1681	50		2050
9	37	1369	61		2287
10	33	1089	92		1386
Total	$\sum X=417$	$\sum X^2=18063$	$\sum Y=558$		$\sum XY=24038$

Question 11

As a student of PSY 412, you are being consulted by a final student from another institution on his/her data collected for final project. With five points, how will you convince her to use Statistical Package for Social Sciences (SPSS) for data analysis?

Question 12

Highlight **three limitations** associated with the use of each statistical analysis

(a). Correlation Analysis (b). Analysis of Variance (ANOVA) (c). Factorial Analysis

(d). Regression Analysis (e). Kruskal Wallis H Test (f). Kolmogorov Smirnov test