**ARI 2101 Introduction to Statistics and Data Analysis**

**Lecturer** Dr. Florence Birungi Kyazze B.Sc. Agric., M.Sc. Agric (Agric Econ.), PhD (Agricultural Education)

**Course Type**: **CORE (BARI II.)**

**Course Credits (CU)**: **3 CU i.e. 45 Contact Hours per semester**

Prerequisite: EEE 1201: Social Research Methods 1

**Course Duration**: **15 weeks (45 hours) i.e. 30 LH, 30 PH/TH**

**COURSE DESCRIPTION**

The course equips students with knowledge and skills in analysis of qualitative and quantitative data. It covers: definition of basic statistical concepts; descriptive statistics; data coding, summarizing and presentation techniques; analyzing, and drawing conclusions from data using both qualitative and quantitative research methods. Reporting research results to various audiences (academic, policy, management/practitioners, communities etc…); integrating qualitative and quantitative data. Students will be introduced to the use of computer and statistical software packages to analyze data sets.

**2. COURSE OBJECTIVES**

The course aims at stimulating the statistical mindset of students in an effort to model a graduate with a holistic approach to data analysis using both qualitative and quantitative analytical tools in real life situations.

The **specific objectives** are to:

1. provide students with general knowledge about the basic theories and concepts of qualitative and quantitative data analysis procedures;
2. introduce students to the various types of statistical procedures (qualitative and quantitative) , their appropriateness and applicability in real life situations;
3. equip students computer data analysis and interpretation skills to competitively write research reports and publication for both donor communities and academic purposes; and
4. enable students to apply and integrate various qualitative and quantitative data analysis procedures in real life situations.

**3. RECOMMENDED REFERENCES FOR READING**

1. Amin, M.E. (2004). *Foundations of Statistical Inference for Social Science Research.*MakerereUniversity. MakerereUniversity Printery. (Available in the School of Education)
2. Coffey, A., Holbrook, B. & Atkinson, P (1996). *Qualitative Data Analysis: Technologies and Representations.* Sage Publications, Thousand OaksCalifornia. Available at, [http://www.socresonline.org.}k/socresonline/1/1/4.html](http://www.socresonline.org.uk/socresonline/1/1/4.html)
3. Erickson, B.H. & Nosanchuk, T.A. 1992. *Understanding Data*. Second Edition. Toronto: University of Toronto Press.
4. Hopkins, K.D., Hopkins, B.R., & Glass, G.V. (1996). *Basic Statistics for the Behavioral Sciences.* Allyn & Bacon, A Simon & Schuster Company, Needham Heights, MA02194 (Available in the Departmental Library, Department of Agricultural Extension Education).
5. Impact Aósessment Centre (n.d). *Qualitative Methods/Quantitative Statistical Methods.* Available at, [http://www*.*microfinancegateway.org](http://www.microfinancegateway.org)
6. International Statistical Institute (n.d.). *Free Statistical Tools on the Web.* Available at, [http://www*.*](http://www.)isi.cbs.nl/FreeTool.htm

**4. COURSE CONTENT, METHODS OF INSTRUCTION, TOOLS AND EQUIPMENT REQUIRED**

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| **TOPIC** | **CONTENT** | **METHOD OF INSTRUCTION / Time allocated** | **TOOLS / EQUIPMENT NEEDED** |
| 1. Introduction to Statistics | * Discussion of class overview * Definition of statistics * Types of statistics * Major differences between descriptive and inferential statistics * Basic Terminology in Statistics | Interactive Lectures (2hrs)  Tutorial sessions (2hrs) | Flash cards, Markers White Board, Laptop, LCD Projectors, Paper |
| 1. Classification of research variables | * Major classification of research variables  1. Quantitative and Qualitative variables 2. Continuous and Discrete variables 3. Independent and Dependent variables  * Other classification of research variables  1. Extraneous research variables 2. Active research variables 3. Attribute research variables 4. Manipulated research variables | Interactive Lectures (2hrs)  Tutorial sessions (2hrs) | Flash cards, Markers White Board, Laptop, LCD Projectors, Paper |
| 1. Scales of measurement of research variables | * Nominal Scale of measurement * Ordinal Scale of measurement * Interval Scale of measurement * Ratio Scale of measurement | Interactive Lectures (2hrs)  Tutorial sessions (2hrs) | Markers White Board, Laptop, LCD Projectors  Paper |
| 1. Introduction to the Statistical Package for Social Scientists (SPSS) | * Historical overview of SPSS * Entering Data into SPSS * Variable properties and description * Using the output viewer * Importing data sets from external files * Variable manipulation and transformation | Interactive Lecture (2hrs)  Computer laboratory (2hrs) | Markers White Board, Laptop, LCD Projector, Desktop computers  SPSS software |
| 1. Measures of Central Tendencies as Data Analysis Tools | * Measures of central tendencies as Data Analysis Tools * Measures of central tendencies defined * Types of measures of central tendencies  1. The mean 2. The mode 3. The median | Interactive Lecture (2hrs)  Computer laboratory (2hrs) | Markers White Board, Laptop, LCD Projector, Desktop computers  SPSS software |
| 1. Interpretation of Data using measures of central tendencies | * Major Differences between the different measures of tendencies * Using the different measures of central tendency to interpret data * How to choose an appropriate measure of central tendency * Pros and cons of the different measures of central tendency | Interactive Lecture (2hrs)  Tutorial session (2hrs) | Markers White Board, Laptop, LCD Projector |
| 1. Data Analysis Tools | * Measures of Central Tendency and Population Distribution Patterns * Types of Distributions  1. Normal Distributions 2. Skewed Distributions 3. Bimodal Distributions 4. Unimodal Distributions | Interactive Lectures (2hrs)  Computer Laboratories (2hrs)  Independent study (3hrs) | Markers White Board, Laptop, LCD Projector, Desktop computers  SPSS software |
| 1. Measures of Variability as Data Analysis Tools | * Measures of variability as data analysis tools * Measures of variability defined * Types of measures of variability  1. Variance 2. Standard deviation 3. The range 4. The interquartile range | Interactive Lectures (2hrs)  Computer Laboratories (2hrs) | Markers White Board, Laptop, LCD Projector, Desktop computers  SPSS software |
| 1. Interpretation of Data using measures of dispersion | * Major Differences between the different measures of variability * Using the different measures of variability to interpret data * How to choose an appropriate measure of variability * Pros and cons of the different measures of variability | Interactive Lecture (2hrs)  Tutorial session (2hrs) | Markers White Board, Laptop, LCD Projector |
| 1. Data Management in Statistical Analyses | * Introduction to Data management practices * Rationale for Data management in research studies * Spread sheet data entry and organization * Limitation of using data spreadsheets * Screening and cleaning data | Interactive Lecture (2hrs)  Tutorial session (2hrs) | Markers White Board, Laptop, LCD Projector |
| 1. Processing of Data for Analysis | * Introduction to SPSS * Data validation and checking techniques * Data manipulation techniques * Role of the research in process data | Interactive Lecture (2hrs)  Computer Laboratory (2hrs) | Markers White Board, Laptop, LCD Projector, Desktop computers  SPSS software |
| 1. Using tables to Organize and summarize quantitative Data | * Introduction to Data coding, screening and cleaning * Categories of Tables * Characteristics of good tables * Types of statistical tables  1. Frequency tables 2. Relative frequency tables 3. Cumulative frequency tables   Interpretation of data using the various table formats | Interactive Lectures (2hrs)  Computer Laboratories (2hrs) | Markers White Board, Laptop, LCD Projector, Desktop computers  SPSS software |
| 1. Using graphs to Organize and summarize quantitative Data | * Rationale for using graphs to present quantitative data * General characteristics of good graphs * Types of graphs  1. Histograms 2. Bar graphs 3. Line graphs 4. Pie charts  * Interpretation of data using the various graph formats | Interactive Lectures (2hrs)  Computer Laboratories (2hrs) | Markers White Board, Laptop, LCD Projector, Desktop computers  SPSS software |
| 1. Analysis of Qualitative Data | * What is Qualitative Data? * Approaches to Analyzing Qualitative Data * Framework for Qualitative Data Analysis | Interactive Lectures (2hrs)  Tutorial session (2hrs) | Markers White Board, Laptop, LCD Projector |
| 1. Integrating quantitative and qualitative data | * Qualitative and Quantitative Data Analysis: Pros and Cons * The need to Integrate Qualitative and Quantitative Data Analysis Approaches | Interactive Lectures (2hrs)  Tutorial Sessions (2hrs) | Markers White Board, Laptop, LCD Projector, |

**5. SUMMARY OF TIME NEEDED**

Interactive lectures covering theory 30 hrs

Tutorial Hours 12 hrs

Computer Laboratories 18 hrs

**6. OVERALL COURSE EVALUATION**

Continuous Assessment Test 20%

Take Home and Computer Laboratory assignment 20%

Final examination 60%.