Stat-202   <u>BIO-STATISTICS AND COMPUTER APPLICATIONS</u>   **3(2-1)**

Theory

Introduction and scope of biostatistics. Types of data. Scales of measurements. Frequency distribution for continuous, discrete and nominal data. Visual representation of data, stem and leaf display, box-whisker plots, Measures of location and measures of variability. Sampling distribution of mean and difference between means and its properties. Testing of hypothesis for mean, proportion, difference between mean and difference between proportions. Measurer of diversity. Analysis of variance. Non-parametric methods. Introduction to computers and operating system.

Practical

Working with MS Word and Excel. Use of Minitab biostatistics software packages for data analysis.

Suggested Reading:

1. Muhammad, F. 1995. Statistical methods and data analysis. Kitab Markaz, Bhawana Bazaar, Faisalabad, Pakistan.

2. Minitab Manual

Stat-301   **Introduction to Statistics**   **2(2-0)**

Definition and importance of statistics in agriculture, Data, Different type of data and variable, Scales of measurement, classification and tabulation of data, graphical representation of data, box plot, stem and leaf diagram.

Measures of central tendency: Definition and calculation of arithmetic, geometric and harmonic mean, median, mode, quantiles, grouped and ungrouped data and graphic location of mode.

Definition and calculation of absolute and relative measures of dispersion, Moments for grouped and ungrouped data. Skewness and kurtosis.

Books Recommended:

1) Chowdhary M.R., (2001). 2nd Edition, Polymer's Modern Statistics. Polymer's Publications Urdu Bazar, Lahore.
2) Muhammad F., (2000). Statistical Methods and data analysis. Kitab Markaz, Aminpur Bazar, Faisalabad.
3) Choudry S.M. and kamal S., (1996). 6th edition, Introduction to statistical Theory. Ilmi Kitab Khana Kabir street, Urdu Bazar Lahore.

Sampling, probability and nonprobability sampling, simple random sampling and stratified random sampling. Sampling distribution of the mean and of the difference between two means. Sampling distribution to the proportion and of the difference between two proportions. Statistical Infeerence: point and Interval estimates of population mean, proportion and variance Testing of hypothesis about difference between two means, proportions and variance, Calculation of one way and two way analysis of variance. Test of association of attributes, Calculation of simple linear correlation and simple linear regression and its interpretation.

Books recommended:

1) Zar J.H., (2003). 4th Edition, Biostatisticial Analysis.
2) Chowdhary M.R., (2001). 2nd Edition, Polymer,s modern Statistics, Polymer,s Publications Urdu Bazar, Lahore.
3) Muhammad F., (2000). Statistical Methods and data Analysis. Kitab Markaz, Aminpur Bazar, Faisalabad.
4) Choudhry S.M. and KamalS., (1996). 6th Edition, Introduction to Statistical Theory. Limi Kitab Khana Kabir Street, Urdu Bazar Lahore.

Classification of experiments: Control condition and field experiments; Principles of Experimental Designs; Data transformations; Correlation and regression; Concepts and analysis; Multiple comparisons and their applications; Analysis of multi observation data; Analysis of data from series of experiments; Soil heterogeneity and solution of related problems; Experiments in farmers fields as a test site; Application of multivariate technique for soil data; Geostatistics.

Practical

Combine experiments and data analysis; Statistical package Minitab or SPSS or Genstat will be used for practical to demonstrate analysis of soil and environment data.

Books Recommended:

1) Zar J. (2003). Biostatisticial Analysis . 4th Edition,. Rentice Hall. Upper Saddle River, NJ, USA.
2) Montgomery, D.C., E.A. Peck and G.G Vining. 2001. Introduction to Linear Regression Analysis. 3rd Ed. John Wiley and Sons, NY, USA
3) Decierg, E.L., W.H. Leonard and A.G. Clark. 1998. Field Plot Techniques. National Book Foundation, Govt. of Pakistan, Islamabad, Pakistan.
4) Sharma, S. 1996. Applied Multivariate Techniques. John Wiley and Sons, NY, USA
5) Upton, G. And B. Fingleton. 1997. Spatial data analysis by Example. Vol. 1 and 2, John Wiley and Sons, NY, USA.

Stat 401   **Experimental Designs**   **2(2-0)**

Basic principles of Experimental Design, Layout and analysis of completely randomized, randomized complete block and latin square design. Estimation of missing value. Relative efficiency of different design. Multiple comparison tests, Introduction to factorial experiments, main effects and interactions, Split plot Experiments.

Books Recommended:

1) Zar J.H., (2003). 4th Edition, Biostatisticial Analysis.
2) Chowdhary M.R., (2001). 2nd Ecition, Polymer's Modern Statistics. Polymer's Publications Urdu Bazar, Lahore.
3) Muhammad F., (2000). Statistical Methods and data analysis. Kitab Markaz., Aminpur Bazar, Faisalabad.
4) Choudhry S.M. and Kamal S., (1996). 6th Edition, Introduction to Statistical Theory. Limi kitab khana kabir Street, Urdu Bazar Lahore.

Stat 404   Introductory Statistics and Computer Applications   4(3-1)

Objectives:

The objectives of this course is to make students have ability to understand the different statistical design techniques.

Theory:

Introduction to Statistics. Descriptive Statistics, Statistics in decision making. Graphical representation of Data Stem and Leaf Plot, Box-Cox plots, Histograms and Ogive. Measure of central tendencies, dispersion for grouped and ungrouped Data. Moments of frequency distribution: examples with real life, use of Elementary statistical packages for explanatory Data analysis. Counting techniques, definition of probability with classical and relative frequency and subjective approaches, sample space, events, Lwas of Probability. Conditional probability and Bayes theorem with application to Random variable (Discrete and continuous) Binomial. Poisson. Geometric. Negative Binomial Distribution; Exponential Gamma and Normal distributions.

Practical: Application of different statistical design techniques.

Books Recommended:

1) Chaudhry. S.M. 2008. Introduction to Statistical Theory. Ilmi Kitab Khana. Lahord.
2) Snedecor. G. W. 200 Statistical Methods. IOWA State Univesity Press, U.S.A
3) Walpole. R.E, 2002. Introduction to Statistics. Macmillon Publishing Company. New York.

Stat-501   Introduction to Statistics   2(2-0)

Definition and scope of statistics in research, Measurement scales, Type of variables, continuous and discrete data. Grouping of data. Presentation of data, tabular presentation, one dimensional diagrams and graphic presentation of Qualitative, Quantitative and grouped data,, stem-leaf and box plots. Measures of central tendency and their graphic location. Measures of dispersion, The chebychev law,

Books recommended:

1. Choudhry, M.2000. Introduction to statistical theory. Ilmi kitab khana Urdu bazaar, Lahore.
2. Muhammad F.2000 Statistical methods and data analysis. Kitab Markaz, Bhawana bazaar, Faisalabad.

Zar J. H. 2009. Biostatistical Analysis. Prentice Hall 5th Edition Prentice Hall

Stat-502   Experimental Design   2(2-0)

        Sampling and sampling distribution of single population mean and single proportion.. Tests of significance for single population mean and proportion and their Confidence Interval, difference between means and proportions and their confidence intervals. One and two way Analysis of variance calculations only.

Books recommended:

1. Choudhry, M.2000. Introduction to statistical theory. Ilmi kitab khana Urdu bazaar, Lahore.
2. Muhammad F.2000 Statistical methods and data analysis. Kitab Markaz, Bhawana bazaar, Faisalabad.

Zar J. H. 2009. Biostatistical Analysis. Prentice Hall 5th Edition Prentice Hall