

SYLLABUS OF CERTIFICATE COURSE

BOT4APB: APPLIED BIostatISTICS

Coordinator: Mr.Unaisudheen TP.

Duration: 30 Hours

Objectives

- To learn to distinguish between statistical conclusions that are likely to be valid and those that are seriously flawed.
- To form a mathematical analysis that uses quantified models, representations and synopses for a given set of experimental data or real-life studies.
- It is used to keep records, calculate probabilities, and provide knowledge

Outcomes

- It helps to solve medical problems which have far-reaching positive impacts in society.
- Able to effectively conduct research
- Students will formulate complete, concise, and correct mathematical proofs

Module I (7 Hours)

1. Introduction to Biostatistics: Importance and limitations of Biostatistics
2. Observations: direct and indirect observations, controlled and uncontrolled observations, human and machine observations.
3. Data collection: Introduction; Sampling; random and non-random.
4. Representation of data; Tables, Bar diagram, Pie diagram, Histogram, Frequency polygon, Ogive, Frequency curve [both manual and using computer].
5. Interpretation and deduction of data, significance of statistical tools in data interpretation, errors and inaccuracies.

Module II (7 Hours)

1. Measures of central tendency: mean, median and mode
2. Measures of dispersion: Range, Mean Deviation, Variance, Standard Deviation, Coefficient of variation.
3. Correlation and Regression analysis- coefficient of correlation- significance testing. Rank correlation. Lines of regression- coefficient of regression.
4. Test of hypothesis: Null hypothesis, Alternate hypothesis Chi-square test.

Module III (7 Hours)

1. Tests of significance- formulation and testing of hypothesis- testing the probability of committing type 1 and type 2 errors. z test, t test, chi-square test.
2. Analysis of variance- one way classification and two way classification, F test, F value calculation, F table.
3. Experimental designs- designing an experiment- CRD, RBD, LSD. Factorial experiments.
4. Probability- application of the principles of probability- theorems of probability- applications- Probability distributions- binomial, multinomial, normal and poisson distributions.
5. Statistical soft wares - SPSS, SPAR, MINITAB. R- Studio

Practical (9 Hours)

1. Work out problems under all types mentioned in the syllabus. One example each from all categories should be recorded.
2. Familiarize the technique of data representation (bar diagram, histogram, pie-diagram and frequency curve (both manual and using computer).
3. Problems from Mean, standard deviation, Coefficient of variation, tests of significance and correlation analysis.
4. Use of computer programmes for statistical analysis

References

1. Chandal S.R.S. A Handbook of Agricultural Statistics. AchalPrakashan Mandir, Kanpur, India.
2. Das M.N. and N.C. Giri. Designs and Analysis of Experiments. Wiley Eastern Ltd.
3. Elhance and Elhance. Fundamentals of Mathematical Statistics. Kithab Mahal, New Delhi, India.
4. Gupta S.K and V.K. Kapoor. Fundamentals of Mathematical Statistics. Sultan Chand & Sons, New Delhi.
5. Gupta C.B. An Introduction to Statistical Methods. Vikas Publishing House Pvt. Ltd
6. Kempthorne, O. An Introduction to Genetic statistics. John Wiley and Sons Inc. New York.
7. Mather K. and J.L. Links. Biometrical Genetics. Chapman and Hall, London.
8. Panse, V.G and P. Sukatme. Statistical Methods for Agricultural Workers. ICAR, New Delhi.
9. Rao C.A. Advanced Statistical Methods in Biometrical Research. Wiley and Sons, New York.
10. Singh P. and S.S. Narayanan. Biometrical Techniques in Plant Breeding. Kalyani Publishers, New Delhi.
11. Singh R.K. and Chaudhary B.D. Biometrical Methods in Quantitative Genetic Analysis. Kalyani Publishers, New Delhi.
12. Daniel W.W. Biostatistics- A foundation for Analysis in Health Sciences.