

Principal paper BT302 Research Methodology and animal biotechnology

Section: I

Unit 1

- 1.1. Characteristics and types of scientific research, Basics of research methodology, Research and Experimental design, Method of Data collection
- 1.2. Scientific Deliveries and Communications: Writing Research proposal, Paper, Thesis, Report and Citations, Presenting scientific research: Power point presentations, Posters, Flyers, etc.
- 1.3. Publication processes, Review Processes and Significance of scientific communications
- 1.4. Study of Critical review and scientific Paper in Microbiology

Unit 2

- 2.1. Definition and scope, Organizing a statistical survey and presentation of statistically analyzed information, Basic statistical methods: Measures of central tendency, dispersion and standard error; Probability distributions: binomial, poisson and normal distribution
- 2.2. Statistical significance: Hypothesis testing, types of error, level of significance, Student's t test, F test and Chi square goodness of fit
- 2.3. Comparing Parametric and Non parametric statistics, Rank test, F-max test, Mann –Whitney (U) test, and Sign test, Applications of non parametric statistics in biological research
- 2.4. Simple linear regression and correlation analysis,

Section: II

Unit 3

- 3.1. Equipments and materials for animal cell culture technology. Introduction to the balanced salt solutions and simple growth medium
- 3.2. Brief discussion on the chemical, physical and metabolic functions of different constituents of culture medium Role of carbon dioxide ,serum and supplements, Serum and protein free defined media and their applications
- 3.3. Primary and established cell line cultures, Measurement of viability and cytotoxicity
- 3.4. Basic techniques of mammalian cell culture; Cell cloning and cell separation. Cell synchronization, cell transformation..

Unit 4

- 4.1. Scaling up animal cell culture. Industrial applications of animal cell culture.
- 4.2. Stem cells: somatic stem cells and embryonic stem cells and their applications.
- 4.3. Methods for generation of transgenic animals.
- 4.4. Applications of transgenic animals.

.References:

1. Gibas Developing Bioinformatics computer skill.
2. Freshney, R. I.: Culture of Animal Cells. Wiley - Liss
3. Masters, J.R. E. (ed): Animal Cell Culture – Practical Approach, Oxford Univ. Press.
4. Basega, R. (ed): Cell Growth and Division: A Practical Approach. IRL Press.
5. Butler, M. and Dawson, M. (eds.): Cell Culture Lab Fax, Eds., Bios Sci. Publ.
6. Clynes, M. (ed): Animal Cell Culture Techniques, Springer