

MOHANLAL SUKHADIA UNIVERSITY, UDAIPUR

B. Sc. BIOTECHNOLOGY II YEAR TDC (2016-17)

Paper V : *Biophysics and Biostatistics*

Unit-I

Radioactivity – radioactive nucleus, half life, physical and biological half life, handling and standardization of α emitting and β emitting isotopes, radioactive tracer technique, autoradiography, radio pharmaceuticals.

Spectroscopic principles, energy levels, excitation absorption, electronic, vibrational, rotational spectra. UV and visible spectroscopy. Raman spectra, application to biomolecules, UV-visible and IR spectroscopy fluorescence.

15 Credit hours

Unit-II

Elucidation of intact biological structures in living organisms. ultrasound, optical fibres X-ray, X-ray diffraction, CAT, Electrocardiography, Electro-encephalography and NMR imaging.

Colorimetry and spectrophotometry : fundamental laws of colorimetry-Lambart and Beer's law, types of colorimeter and Spectrophotometer.

15 Credit hours

Unit-III

Instrumentation – instruments used for thermoregulation, centrifuges analytical and different pH meter, G.M. counter, scintillation counter, Fluorescent, light and phase contrast microscope, scanning and transmission electron microscopes, electrophoresis apparatus.

15 Credit hours

Unit – IV

Tabulation and classification of data, frequency distribution and graphical distribution of data. Measures of central tendencies – mean, median, mode and their properties. Measures of dispersion – mean deviation, variance, standard deviation and coefficient of variation, correlation coefficient.

15 Credit hours

Unit – V

Concepts and problems on probability, random variable and its expectation, binomial, poisson, normal distribution and their applications. Different models of data presentations with special reference to biological samples. Random sampling, sampling distribution, standard error, concepts in hypothesis testing, large sample test for means and proportions (simple problems).

15 Credit hours

Suggested Readings

1. Daniel, M. 1999. Biostatistics (3rd Edition). Panima Publishing Corporation.
2. Pattabhai, V. and Gautham, N. Biophysics. Narosa pub.
3. Zar, J.H. Biostatistical Analysis. Pearson Edu.
4. Gupta, S.C. and Kapoor, V.K. Fundamentals of applied statistics. S. Chand and Company.
5. Dutta, N.K. Fundamentals of Biostatistics. Kanika Pub. New Delhi.
6. Arora, P.N. and Malhan, P.K. Biostatistics. Himalya Publishers.
7. Swardlaw, A.C. Practical statistics for experimental Biology. John Wiley and Sons.
8. Campbell, R.C. Statistics for Biologist. Cambridge University Press.
9. Bliss, C.J.K. Statistics in Biology. McGraw Hill.
10. Narayan, P. Essentials of Biophysics. New Age International.
11. Roy, R.N. A Text Book of Biophysics. New Central Book Agency.
12. Daniel, M. Basic Biophysics. Agrobios.