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CLUSTER UNIVERSITY SRINAGAR

SYLLABUS FOR BIOTECHNOLOGY (BT)

COURSE FOR B.SC PROGRAM UNDER CBCS SCHEME

Course: Biotechnology (BT) (Credits: Theory-4, Practicals-2)

SEMESTER-III

COURSE TITLE: BIO-TECHNIQUES AND BIO-STATISTICS

Unit-I

Centrifugation: Principle, theory and Application of Differential and Analytical Centrifugation, Derivation of Sedimentation Coefficient, Density gradient centrifugation. Types of Rotors; Electrophoresis: Principle, Theory Application of Agarose, Poly Acrylamide Gel Electrophoresis (under native and denaturating conditions).

Unit-II

Principles and Methodology of: Isoelectric focussing and 2D Gel Electrophoresis, Western, Northern & Southern Blotting, Polymerase chain reaction (PCR), PCR and hybridization based markers (RFLP, RAPD and AFLP). Immunodiffusion, Immmunoelectrophoresis, ELISA, RIA.

Unit-III

Chromatography: Principle, Theory and Application of Thin layer, Ion Exchange, Gel exclusion, Affinity, HPLC Chromatography; Spectrophotometers: Beer and Lamberts Law and its Applications.

Unit-IV

Sample, Population, Sampling Techniques; Mean, Median, Mode and their comparison; Frequency Distribution; Standard Deviation, Standard Error of Mean (SEM); p-Value; Student t-Test (Paired and Unpaired); Chi square Test; Graphical Representation of Data (Histogram, Bar Chart, Pie chart, Frequency curve, etc).

Practicals:

1. Paper and Thin Layer Chromatography.
2. Preparation of Buffers and Dyes for Electrophoresis.
3. Preparation of gel for Electrophoresis.
4. Use of excel for calculating: Mean, Mode, Median.
5. Use of excel for drawing, histogram, bar-chart & pie-chart.

Books Recommended:

1. Principles and Techniques of practical Biochemistry: Keith Wilson, John Walker
2. Principles and Techniques of Biochemistry and Molecular Biology: Keith Wilson, John Walker
3. Basic Biostatistics: Bert Gurtsman