THE CLUSTER UNIVERSITY OF SRINAGAR
Syllabus for B.Sc. I$^{st}$ Year (Semester –I)
**Subject: Bioinformatics.**
(Session- 2017-2018)

# Semester I

**Unit I**

Introduction to genetics and lts importance: Mendelian genetics, Population genetics and lts applications. Gene concept, alleles, transposable elements. Genetic linkage and mapping, brief idea of genetic disorders.

**Unit II**

DNA: Nucleotides and Nucleosides, DNA Structure, non-coding and coding DNA, repeated sequences, satellite DNA, tandem repeats, VNTRs, junk DNA, palindromes, inverted repeats. Conformations A, B, C and Z). Super- coiling of DNA (Linking No., Twisting, Contour length) RNA, and its types and functions. tRNA Structure and function. DNA replication, transcriptional, post transcriptional modifications, translation.

**Unit III**

Amino acids, Structure, classification and properties. Levels of protein structure, importance and determination of primary structure. Secondary structure (Alpha helix, Beta sheet and beta turns). Characteristics of peptide bond ($\varphi$ and $\Phi$ bonds). Super secondary structures, protein domains. Tertiary structure of proteins. Quartenary structure of Proteins.

**Unit IV**

Chemical and enzymatic synthesis of DNA and RNA. Purification of Nucleic acids. Gel electrophoresis, Blotting techniques and hybridization. DNA finger printing, foot printing, PCR and Chromosome walking. DNA sequencing.

**Practicals:**

1. Estimation of Proteins by Lowry's method.
2. Isolation of DNA from Bacterial Cells.
3. Isolation of DNA from Plant Cells.
4. Isolation of DNA from Blood.

**Books Recommended:**


1. Genetics : A Conceptual Approach: Benjamin A pierce.
2. Instant Notes in Molecular Biology: Phil Turner *et al.*,
3. Applied Molecular Genetic: Roger I Miesfeld.
4. Molecular Biology: David P Clark.