Scripting and Computer Environments (SSCE131C)

(Credit hours: Theory-3, Lab-1)

COMPONENT 1

UNIT 1

Basics, Function, Modules, Collections, Control Statements, File Handling, Pattern Matching

UNIT 2

Sequence Objects, Sequence Handling, Search Tools, Online Databases

COMPONENT 2

UNIT 3

Handling PDBs, Local and Global Alignments, Dynamic Programming: Smith & Waterman, Needleman & Wunsch Algorithm

UNIT 4

Multiple Sequence Alignment, Concepts & Implementations, Amino Acid Substitution Matrices PAM & BLOSUM Derivation of Dayhoff Matrices, Profiles & Motifs General Tools, Techniques & Resources Clustal W, BLAST and FASTA

Text/Reference Books:

- Bioinformatics Programming Using Python
  Mitchell L Model, O'Reilly
- Biopython Tutorial and Cookbook
  Jeff Chang, Brad Chapman, Iddo Friedberg, Thomas Hamelryck, Michiel de Hoon, Peter Cock, Tiago Antao, Eric Talevich, Bartek Wilczynski
- Molecular Modeling: Principles and Applications (2nd Edition)
  Andrew R. Leach (Prentice Hall)
- Proteins: Structures and Molecular Properties
  Thomas E. Creighton (Freeman)

Guide lines for practicals:

One credit lab is to be conducted by covering the most relevant and useful topics from aforementioned syllabus.