

# Scripting and Computer Environments (SSCE131C)

(PERL, PYTHON, R)

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

## COMPONENT 1

### UNIT 1

Introduction to programming, statements, numeric, string literals, variables, arrays and hashes, control statements, subroutines, file handling, regular expression

### UNIT 2

References, Advanced Programming in Perl Packages, Object Oriented Programming, BioPerl

### Text/Reference Books:

1. Learning Perl  
Randal Schwartz, Tom Phoenix, drian d foy (O'Reilly)
2. Molecular Modeling: Principles and Applications (2nd Edition)  
Andrew R. Leach (Prentice Hall)
3. Proteins: Structures and Molecular Properties  
Thomas E. Creighton (Freeman)
4. Fast Lane to Python  
Norm Matloff, UC Davis ([link](#)).

## COMPONENT 2

### UNIT 3

Introductory Python and R, Local & Global Alignment Algorithms, 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.

### Guide lines for practicals:

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