B. Sc. Agricultural Biotechnology Syllabus

Course No   : **CS-3510**   Course Title   : **Computer Application in Biotechnology**
Credits   : **3(2+1)**   Semester   : **V**

CS-3510: Computer Application in Biotechnology 1+2
Theory:
Introduction to computers and window O.S. introduction to MS word, MS *power* point, MS Excel. Network & its type Internet , www. Multimedia and its types . Data base management sys. Introduction to programming with C – language. Introduction to web sites, E-mail, programming in Perl.

Practicals:
Internet, E-Mail, Internet surfing. Database management sys. Programming in C. Programming
in Perl.

Reference books:
1.The concept guide to Microsoft office. Mansfield Ron 1994 BPB publications, New Delhi.
2. Mastering the internet- Glee Harrah Cady and Pat Mc Gregor 1995 BPB publications, New Delhi.
3. Rapidex computer course 4th Edn. 1996. Gupta V., Pustak Mahal, Delhi.
4.Windows 95 A to Z. Galgotia S. 1996. Galgotia Publications (P) ltd., New Delhi.

Course No   : **PB-369**   Course Title   : **Introduction to Bioinformatics**
Credits   : **3(2+1)**   Semester   : **VI**

PB-369: Introduction to Bioinformatics 1+2
Theory :
1. Introduction, Scope and application of Bioinformatics
2. Biological database, NCBI, ENSEMBL, EBI, EXPASY, Genbank ,AgriCola
3. Computer tutorial, introductory programming,
4. Computers and biology, online resources for bioinformatics,
5. Simple pair wise alignment, Induction to Blast , FASTA, BLAST searching, BLAST and PHI/PSI-BLAST,
6. Introduction to Gene expression and microarrays,
7. Introduction Micro array data analysis,
8. Introduction to protein structure and structural databases,
9. Molecular visualization, Basics of Proteomics, Bioinformatics methods for studying proteins,
10. sequence alignment, Pairwise alignment Multiple sequence alignment tools for alignments (CLUSTALX, CLUSTAL W),
11. Concepts in Protein structure prediction,
12. Phylogeny, cladistics, and evolution, Phylogenetic trees
Practicals:
1. Find Agribiotechnology related research paper fromAgriCola
2. Find Research paper fromNCBI-pubmed
3. Study of NCBI database with different parameters

4. Primary work on Entrez Home Search engine

5. Find out 5 Plant genome related Genes from different Plant Genome database with specific characters (3)

6. Study on Plant genome database

7. Data analysis of Rice genome with Nutritional valuable genes

8. Find out the present stress tolerance gene

9. Study on Introduction of BLAST

10. Analysis of Basic sequence analysis with BLAST

11. A biochemist suspects that P450 protein sequences are characterized by the following motif: FMFEGHDTTA

a. Use the ScanProsite -- select the Search Swiss-Prot with a PROSITE entry part of the form! -- or FPAT (*server down?*) programs to search for matches to this motif in SwissProt.

b. Take these hits and use PRATT to construct *regular expressions* characterising these sequences. *A brief explanation of what PRATT does can be found here*.

c. Search back into SwissProt with FPAT or ScanProsite using (some of) these patterns and see what hits are obtained.

i. Do these searches return all of the original sequences?