Solapur University, Solapur.

Skill Development Center

Name of course: **Certificate course in Bioinformatics**

Curriculum of Certificate course in Bioinformatics

Medium of the Course	:	English
Duration of the Certificate Course	:	6 Months
Eligibility	:	Admitted to B.Sc. Course.

Project to be submitted at the end of Course.

Examination Pattern	:	Annual Examination Pattern
Theory Paper (Duration -2 hrs)	:	50 Marks
Practical (Duration – 3hrs)	:	30 Marks
Oral and Project	:	20 Marks

Theory & Practical Examination will be held at the end of academic year and certificate will be issued by the affiliating University.

Syllabus

Total Lectures- 45

A) Introduction to Bioinformatics and its Applications in various research areas.

B) Introduction to

NCBI,
DDBJ
EMBL

C) Introduction to biological databases

1) Nucleic Acid, Proteins (Sequence and Structure Databases) genome -structure databases.

2) Protein Data Bank (PDB) and Nucleic acid sequence databases GenBank

D) Search engines ENTREZ

E) Sequence data forms and submission tools

F) Scoring matrices for sequence alignments

G) Algorithms— pair wise sequence alignments.

H) Databases for similarity search sequence

BLAST
FASTA

I) Methods for sequence analysis –

1) Multiple sequence alignment,

2) Phylogenetic analysis and tree building methods,

3) Motif searches

4) Epitope prediction

5) Data mining tools and applications

6) Promoter and gene prediction

7) Comparative analysis.

J) **Structure based approaches-**

1) **Protein secondary structure prediction**
2) **Threading approaches**
3) **Homology based methods for protein tertiary structure prediction**
4) **Visualization tools**
5) **Structure evaluation and validation**
6) **Antigen-antibody interactions.**

Total Lectures-24

Practicals:-

A) Browsing of NCBI website and its contents

B) Browsing of DDBJ website and its contents

C) Browsing of EMBL website and its contents

D) Browsing and exploring of Various Databases

1) **PDB**
2) **GenBank**

E) Exploring data through Entrez

F) Exploring of BLAST

Question Paper Nature

Certificate course in Bioinformatics

Time: 2 hr **Total Marks: 50**

Q. 1. Choose the **most correct** alternative for the following and rewrite the sentence. 10

1) ----------

a) b) c) d)

2)

3)

4)

5)

6)

7)

8)

9)

10)

Q. 2. Answer ***any five*** of the followings. 10

i)

ii)

iii)

iv)

v)

vi)

Q. 3. A) Answer ***any two*** of the followings. 08

i)

ii)

iii)

Q. 4. Answer ***any two*** of the following. 10

i)

ii)

iii)

Q. 5. Write short note/ problem/solve ***any two*** of the following. 12

i)

ii)

iii)