

# CSIR Integrated Skill India Initiative

## Certificate Courses on Advanced Bioinformatics

### Code – IICB-BIO

CSIR-IICB proposes one training course in Advanced Bioinformatics. This course is aimed at imparting skills on data handling using open source bioinformatics tools . At the end of the program, the participants are expected to analyse Next-Gen sequencing data. The courses are targeted to candidates having a postgraduate biological background.

**Educational Qualifications** : M.Sc(any branch of life science)/ M.V.Sc  
M.Tech (Biotechnology) / M.Pharm/MD/MS

#### Content for Bioinformatics Course:

- Introduction to biological databases
- Sequence alignment techniques: pair-wise & multiple sequence alignment
- Phylogenetic analysis for biological sequences
- Introduction to In-silico molecular modeling: Energy optimization (different methods), Homology modeling .
- In-silico Drug designing: Structure based & ligand based drug designing
- Basics of molecular dynamics simulation: molecular dynamics to compute properties of protein structures and their flexibility
- Computational genomics: gene prediction, pattern searching, profile/motif based searching
- Using genome browsers
- Basic statistics using R
- **Genomics**

- An introduction to Sequencing technology and output data types
- Basics of library constructions
- Quality Control of sequenced data and data cleaning for genomic and metagenomic DNA.
- Differential expression analysis using RNAseq technology. Metagenomics
- Metagenomic 16S rRNA data analysis for understanding biological diversity.
- Introduction to the Galaxy suite of tools

### **Salient Features of the course:**

- Theory and practical sessions are per the course curriculum
- Lectures includes the entire process of routine clinical chemistry with multimedia aids
- Hands on training on Programming and Data handling.
- Live Sequencing by Oxford Nanopore Sequencer.
- Sequence Analysis with Next-Gen sequencing data.
- Continuous assessment through theoretical assignments & practical examinations for evaluation
- A certificate will be issued to the successful candidates