

# Advance Bioinformatics AND Clinical Research

(Course duration: 120days)

## **COURSEWORK**

**Introduction to Bioinformatics and overview of Biological Research**

**Biological databases and database searching**

**Data Mining and Sequence Retrieval**

**Motif & Domain assignment**

**Proteomics**

**Protein threading and interaction**

**Pair wise and Multiple Sequence Alignment**

**Sequence Analysis (BLAST, FASTA, CLUSTAL W)**

**Phylogenetic analysis**

**Ab initio structure prediction**

**Visualization tools and Homology Modeling**

**Introduction to chemioinformatics and Drug Development**

**Chemical and Drug Database**

**Structural Bioinformatics in Drug Development**

**Small molecule hits**

**Designing Chemical Structures**

**Pathways studies and Drug Targeting**

**Lead design with Geometry optimization and Energy Minimization**

**Computer simulations**

**Chemical reaction indexing**

**Pharmacophore analysis**

**Docking**

**Chemical Patents**

**FDA in drug trials**

**Introduction to Immunoinformatics and Computational Vaccinology**

**Accessing genome agencies**

**Vaccine database and Data mining**

**T-Cells development**

**Antigen processing and presentation**

**Reverse Vaccinology and Vaccine screening**

**MHC binding**

**Organ Transplant and Auto Immune diseases**

**Epitope prediction and Servers**

**In Silico approach towards AIDS Vaccine and Avian Influenza Virus**

**Vaccine design**

**Relevant Tools and Soft wares**

**Basic Clinical Research**

**Research Projects (2)**