Bioinformatic Methods I & II Training Course

Professional Development Training Course Outline

Category	Research and Data Analysis	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Bioinformatic Methods I & II is a comprehensive, advanced training course designed to equip learners with computational, statistical, and analytical techniques essential for modern biological data analysis. Bioinformatic Methods I & II Training Course integrates molecular biology, genomics, proteomics, transcriptomics, and systems biology with algorithmic thinking, data science, and high-throughput sequencing technologies. Learners gain hands-on experience with biological databases, sequence analysis, structural bioinformatics, and functional annotation, addressing real-world biological and biomedical challenges.

This course emphasizes practical problem-solving using real biological datasets, preparing participants for careers in research, healthcare, biotechnology, pharmaceutical industries, and data-driven life sciences. Through case studies, tool-based learning, and workflow-oriented modules, learners develop proficiency in next-generation sequencing (NGS) analysis, comparative genomics, protein modeling, and systems-level biological interpretation, aligning with current AI-driven and precision medicine trends.

Programme Curriculum

Bioinformatic Methods I & II Training Course

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Course Duration

5 days

Course Objectives

1. Understand core principles of bioinformatics and computational biology
2. Apply sequence alignment and similarity search algorithms
3. Analyze genomic and transcriptomic datasets
4. Interpret functional genomics and gene annotation
5. Utilize biological databases and data repositories
6. Perform protein structure prediction and validation
7. Conduct phylogenetic and evolutionary analysis
8. Implement NGS data analysis pipelines
9. Explore proteomics and metabolomics workflows
10. Integrate systems biology and network analysis
11. Apply machine learning concepts in bioinformatics
12. Develop reproducible bioinformatics workflows
13. Solve real-world biological problems using case studies

Target Audience

1. Life science and biotechnology students
2. Bioinformatics and computational biology learners
3. Research scholars and PhD candidates
4. Faculty members and academic researchers
5. Biotech and pharmaceutical professionals
6. Clinical research and genomics analysts
7. Data scientists entering life sciences
8. Healthcare and precision medicine professionals

Course Modules

Module 1: Introduction to Bioinformatics

- Biological data types and omics technologies
- Bioinformatics workflow and data lifecycle
- Key databases
- Tools and software ecosystems
- **Case Study:** Genome annotation of *E. coli*

Module 2: Sequence Analysis & Alignment

- DNA, RNA, and protein sequences
- Pairwise and multiple sequence alignment
- BLAST and FASTA algorithms

- Scoring matrices and gap penalties
- **Case Study:** Disease gene identification using BLAST

Module 3: Genomics & Transcriptomics

- Genome assembly and annotation
- RNA-Seq data analysis
- Differential gene expression
- Variant calling and SNP analysis
- **Case Study:** Cancer transcriptome profiling

Module 4: Structural Bioinformatics

- Protein structure levels
- Homology modeling techniques
- Structure visualization tools
- Protein-ligand interactions
- **Case Study:** Drug target structure prediction

Module 5: Phylogenetics & Evolution

- Molecular evolution concepts
- Phylogenetic tree construction
- Evolutionary models
- Comparative genomics
- **Case Study:** Viral strain evolution analysis

Module 6: Proteomics & Metabolomics

- Mass spectrometry data analysis
- Protein identification and quantification
- Post-translational modifications
- Metabolic pathway analysis
- **Case Study:** Biomarker discovery in disease

Module 7: Systems Biology & Network Analysis

- Biological networks and pathways
- Gene regulatory networks
- Pathway enrichment analysis
- Network visualization tools
- **Case Study:** Signaling pathway disruption in cancer

Module 8: Advanced Bioinformatics & AI Applications

- Machine learning in bioinformatics
- Big data analytics in life sciences
- Cloud and high-performance computing
- Reproducible research practices
- **Case Study:** AI-based drug discovery pipeline

Training Methodology

This course employs a participatory and hands-on approach to ensure practical learning, including:

- Interactive lectures and presentations.
- Group discussions and brainstorming sessions.
- Hands-on exercises using real-world datasets.
- Role-playing and scenario-based simulations.
- Analysis of case studies to bridge theory and practice.
- Peer-to-peer learning and networking.
- Expert-led Q&A sessions.
- Continuous feedback and personalized guidance.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call *+254769199797*

Certification

Upon successful completion of this training, participants will be issued with a globally- recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

a. The participant must be conversant with English.

b. Upon completion of training the participant will be issued with an Authorized Training Certificate

c. Course duration is flexible and the contents can be modified to fit any number of days.

d. The course fee includes facilitation training materials, 2 coffee breaks, buffet lunch and A Certificate upon successful completion of Training.

e. One-year post-training support Consultation and Coaching provided after the course.

f. Payment should be done at least a week before commence of the training, to Fineskill Training Center account, as indicated in the invoice so as to enable us prepare better for you.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500

Start Date	End Date	Location	Price
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

Ready to enroll or request a customized program? Book online or contact us:

Register Online Now

Email: info@fineskilltrainingcenter.com | Website: www.fineskilltrainingcenter.com