



Online Workshop on Whole Genome Sequencing & Bioinformatics Analysis

Hands-on Training in WGS, Assembly & Comparative Genomics

22-26 June 2026, 6:00 PM IST

About the Course

The 5-Day Online Certification Course on Whole Genome Sequencing & Bioinformatics Analysis is designed to provide participants with practical knowledge and hands-on experience in modern genomic data analysis. Participants will learn how to work with real genomic datasets using widely used bioinformatics tools and public databases such as NCBI, ENA, SPAdes, Prokka, FastANI, MEGA, PHASTER, and IslandViewer. Through guided demonstrations and practical activities, attendees will gain skills in handling sequencing data, performing genome assembly and annotation, conducting ANI and phylogenetic analyses, and understanding genome flexibility and mobile genetic elements.

Course Benefits

- Gain a strong foundation in Whole Genome Sequencing (WGS) and microbial genomics
- Learn to handle real-world genomic datasets and sequencing file formats
- Develop practical skills in genome assembly, annotation, and comparative genomics
- Get hands-on exposure to widely used bioinformatics tools and databases
- Understand phylogenetic analysis, ANI, taxonomy, and genome flexibility
- Learn methods for phage identification and mobile genetic element analysis
- Perform guided practical exercises using authentic genomic data
- Enhance research capabilities in microbiology, biotechnology, and life sciences
- Improve bioinformatics competency for academic, industrial, and clinical applications

Who Can Join?

- UG & PG Students (Life Sciences & Allied Disciplines)
- PhD Scholars, Research Fellows & Faculty Members
- Healthcare, Biotechnology & Pharma Professionals
- Laboratory & Molecular Biology Researchers
- Genomics & Microbiology Enthusiasts
- WGS, Microbial Genomics & Bioinformatics beginners

Fee & Features

₹ 1000(India) | \$65 (Internatinal)

- E-Certificate to Participants
- Online by Google Meet Platform
- Live Sessions
- Interaction with Resource Person
- Lecture PPTs and Recordings to Participants

Day 1: Introduction to Whole Genome Sequencing (WGS)

- What is WGS?
- Applications in microbiology, medicine, and research
- NGS platforms (Illumina, PacBio, Nanopore)
- Overview of sequencing workflow

Tools / Databases

- NCBI
- ENA

Activity

- Explore genome datasets from public databases

Day 2: Bacterial Genome Retrieval & Data Handling

- Bacterial genome structure
- File formats: FASTA, FASTQ, GenBank
- Metadata understanding

Tools

- NCBI SRA
- PATRIC

Activity

- Download a bacterial genome
- View genome annotation files

Day 3: Genome Assembly & Annotation

- Assemble raw sequencing data
- Perform genome annotation
- Assembly concepts: contigs, scaffolds
- De novo vs reference assembly
- Gene prediction & annotation

Tools

- SPAdes
- Prokka

Activity

- Run assembly pipeline (demo)
- Annotate genome

Day 4: ANI, Taxonomy & Comparative Genomics

- Compare genomes and identify relationships
- Average Nucleotide Identity (ANI)
- Genome-based taxonomy
- Comparative genomics
- Phylogenetic analysis

Tools

- FastANI
- MEGA

Activity

- Perform ANI analysis
- Build a phylogenetic tree

Day 5: Genome Flexibility & Phage Identification + Project

- Understand genome variability
- Identify phage sequences
- Genome flexibility (HGT, gene gain/loss)
- Mobile genetic elements
- Phage sequence identification

Tools

- PHASTER
- IslandViewer



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