

SHORT TERM CERTIFICATION COURSE ON

PRACTICAL APPLICATIONS OF BIOINFORMATICS : GENOMIC ANALYSIS

COURSE OBJECTIVES:

- To introduce fundamental concepts and applications of bioinformatics in genomics.
- To introduce fundamental concepts and applications of bioinformatics in genomics.
- To explore comparative genomics and structural genomics techniques.
- To provide hands-on experience with bioinformatics tools for phylogenetic analysis, protein modeling, and molecular docking.
- To familiarize students with functional genomics, RNA sequencing, and microbiome analysis.
- To integrate artificial intelligence and machine learning in genomics.
- To apply bioinformatics methods to real-world case studies and genomic research projects.

ELIGIBILITY:

- UG/PG/ Faculty in Life science or Pharmaceutical Sciences.
- UG/PG / Faculty Diploma or Degree in Applied Health Science

REGISTRATION LINK

<https://forms.gle/U8ZagAtt56QzW97e7>

SCAN AND PAY [INR 500]



SCHOOL OF BASIC AND APPLIED SCIENCE



Patron
Prof. Karunesh
Saxena President
Sangam University



Co-Patron
Prof. Manas
Ranjan Panigrahi
Pro- President SU



Covener
Prof. Preeti
Mehta Dean,
SOBAS

RESOURCE PERSON



Dr. Narotam Sharma
Scientist and Head,
DNA Labs, Dehradun



Dr. Tikam Chnad
Dakal Assistant
Professor, MLSU



Dr. Harish Mangesh
Assistant Professor
MLSU Udaipur



Dr. Abhishek Kumar
Manipal Academy of
Higher Education



Dr. Dr. Alisha Parveen
Manipal Academy of
Higher Education,
Bangalore

COURSE CO-ORDINATOR



Dr. Shahdab Hussain
Associate Professor,
Department of Botany, Sangam
University

Contact-8233152670

Email: shahdab.hussain@sangamuiversity.ac.in

ORGANIZING COMMITTEE

Dr. Gunmala Gugaliya
Mrs. Reena Modi
Mr. Jayant Sharma



PRACTICAL APPLICATIONS OF BIOINFORMATICS : GENOMIC ANALYSIS



17.03.2025 - 03.04.2025

CONVENOR
PROF. (DR.) PREETI MEHTA
COURSE COORDINATOR
DR. SHAHDAB HUSSAIN

Organized by

DEPARTMENT OF BOTONY

SCHOOL OF BASIC AND APPLIED SCIENCE

SANGAM UNIVERSITY, BHILWARA

ABOUT SANGAM UNIVERSITY

Sangam University was established in 2012 by the Badrilal Soni Charitable Trust and is supported by the Sangam Group of Industries. It aims to provide world-class, affordable education accessible to all. The university serves as a hub for holistic growth and global learning. It fosters young minds into future global leaders. Sangam University promotes a professional learning environment while instilling moral and human values.

SCHOOL OF BASIC & APPLIED SCIENCES

The Faculty of Applied Sciences is dedicated to delivering a high-quality education that equips students with the skills needed for successful careers in their respective fields. This goal is pursued through a strong emphasis on teaching excellence, research, and innovation.

The faculty envisions itself as a leading institution in applied sciences, recognized for its interdisciplinary educational approach, robust industry collaborations, and commitment to diversity and inclusion. It aims to nurture graduates who are highly skilled, adaptable, and well-prepared to make significant contributions to society.

"PRACTICAL APPLICATIONS OF BIOINFORMATICS: GENOMIC ANALYSIS"

17 March – 03 April, 2025

SCHEDULE :

Session	Date	Topic	Subtopic	Mode	Recourse person
Week 1: Introduction to Bioinformatics & Sequence Analysis					
1.	17-03-2025	Introduction to Bioinformatics & Genomic Databases	Overview of bioinformatics applications in genomics - NCBI, EMBL, DDBJ, Ensembl, UCSC genome browsers.	Offline	Dr. Tikam Chand Dakal Genome and Computational Biology, Mohanlal Sukhadia University, Udaipur
2.	18-03-2025	Sequence Alignment Basics	Global vs. Local alignment - Pairwise sequence alignment (BLAST, FASTA)	Offline	Dr. Tikam Chand Dakal
3.	19-03-2025	Multiple Sequence Alignment (MSA)	- Clustal Omega, MUSCLE, MAFFT	Online	Dr. Tikam Chand Dakal
4.	20-03-2025	Genome Assembly & Annotation	- Sequencing technologies (Illumina, PacBio, Nanopore) - Genome assembly tools (SPAdes, Velvet)	Online	Dr. Tikam Chand Dakal
5.	21-03-2025	Functional Genome Annotation	- Gene prediction tools (Prokka, Glimmer, RAST)	Online	Dr. Tikam Chand Dakal
Week 2: Comparative Genomics & Structural Genomics					
6.	24-03-2025	Comparative Genomics – Identifying Variations	- SNPs, Indels, Structural variations	Online	Dr. Abhishek Kumar Manipal Academy of Higher Education, Bangalore Institute of Bioinformatics, Bangalore

7.	25-03-2025	Phylogenetic Analysis	- Evolutionary relationships - Phylogenetic tree construction (MEGA, PhyML, IQ-TREE)	Online	Dr. Abhishek Kumar
8.	26-03-2025	Structural Genomics – Protein Modeling	- Protein structure prediction methods - Tools: Swiss-Model, Phyre2	Online	Dr. Abhishek Kumar
9.	27-03-2025	Molecular Docking & Protein Interaction Analysis	- Introduction to molecular docking - Tools: AutoDock, PyMOL	Online	Dr. Alisha Parveen Manipal Academy of Higher Education, Bangalore Institute of Bioinformatics, Bangalore
10	28-03-2025	Genome Editing Tools & CRISPR Bioinformatics	- CRISPR-Cas system and applications - Tools: CHOPCHOP, CRISPR direct	Online	Dr. Alisha Parveen
Week 3: Functional Genomics & Big Data in Genomics					
11.	31-03-2025	RNA-Seq Data Analysis	- Transcriptomics & RNA sequencing - Tools: Kallisto, Salmon, DESeq2	Offline	Dr. Harish Mangesh Assistant Professor, Department of Botany, MLSU, Udaipur
12	01-04-2025	Metagenomics & Microbiome Analysis	- 16S rRNA sequencing & microbiome analysis - Tools: QIIME2, Kraken, MetaPhlan	Online/Offline	Dr. Harish Mangesh
13.	02-03-2025	AI & Machine Learning in Genomics	- AI applications in bioinformatics	Offline	Dr. Narotam Sharma Sr. Scientist & Head, DNA Labs, Dehradun
14.	03-04-2025	Real-World Applications & Case Studies	- Cancer genomics, infectious disease genomics, personalized medicine	Offline	Dr. Narotam Sharma
15.	03-04-2025	Final Project & Report Submission	- Mini-project on genomic analysis	Offline	Dr. Narotam Sharma

