LSSSDC (GOVT. OF INDIA) CERTIFIED 28 CREDIT COURSE

BIOINFORMATICS ANALYST

Empowering Your Career through Practical Training and Industry Recognition

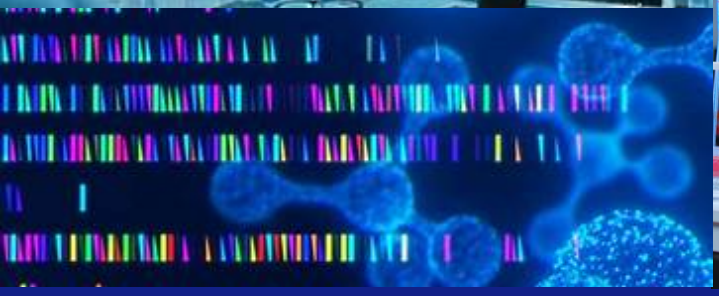
www.dromicsedu.com

Skill India
कौशल भारत-कुशल भारत

LSSSDC™

NCVET
कौशल गुणवत्ता प्रगति

Dr.Omics Labs
The Doctor of your DNA



Why DrOmics Labs

1

Strategic Partnership:

- **MoU** with **Andra Pradesh Government** for Internship.
- Most Prestigious Institute **CDFD Hyderabad, and IIM Lucknow** as the **Incubation Hub** for Dr. Omics Labs.
- Authorized Training partner of **LSSSDC**

2

Certifications Achieved

- **MSME** Certification
- Recognized by **Startup India**
- **ISO** Certification Attained
- **LSSSDC** (Skill India) certified

3

Successfully trained over 15000 students hailing from diverse corners of the world

4

Becoming professionals' top choice: more than. **20000** LinkedIn followers

5

Research Grants

- **AWS**
- **Illumina**
- **Department Of Science & Technology** (Govt. of India)

6

Diverse internships and courses

Our programs cover **NGS Data Analysis**, **CADD**, **Pharmacogenomics,** and **Machine Learning** for Biological Data We offer live virtual training with expert guidance.

DIPP21150 #startupindia · MSME सूक्ष्म, लघु एवं मध्यम उद्यम MICRO, SMALL & MEDIUM ENTERPRISES · ISO 9001 2015 CERTIFIED · aws · illumina · APSCHE · LSSSDC

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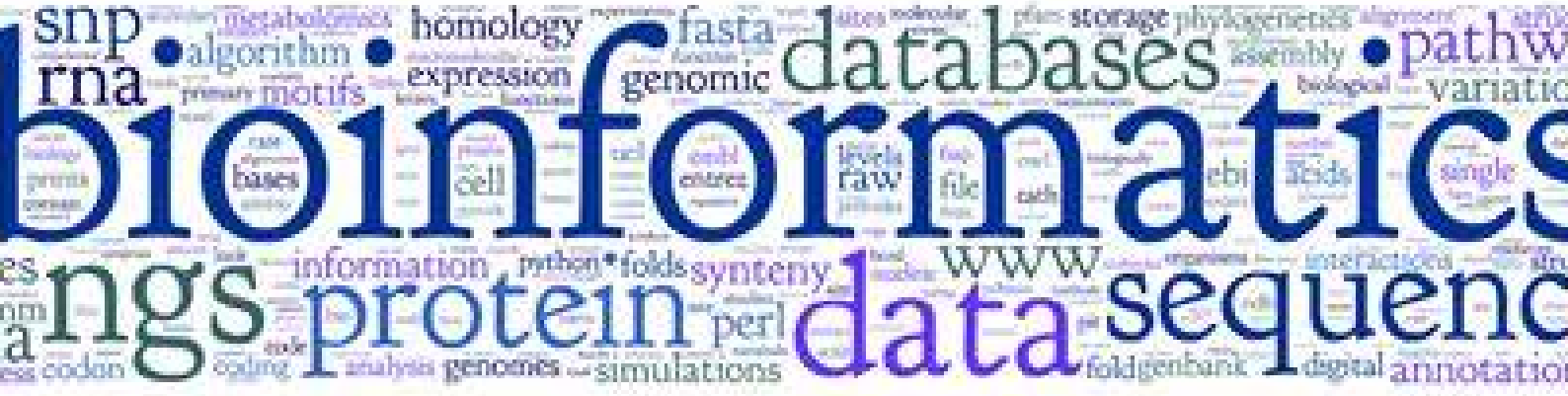
Key Features of Our Course:

1. **28 Credit worth Comprehensive Learning:** Our intensive course is equivalent to 28 Indian Education System Credits, ensuring you receive in-depth training and expertise in bioinformatics.
2. **Practical Approach:** We believe in learning by doing. Our curriculum emphasizes hands-on experience, allowing you to apply theoretical concepts to real-world scenarios, enhancing your problem-solving abilities and practical skills.
3. **Exclusive Interview Opportunities:** As part of our commitment to your success, we provide opportunities for you to interview with well-established companies in the bioinformatics domain. Gain insights into industry practices and secure your dream job.
4. **Third-Party Examination:** To validate your expertise, we offer a third-party examination option. For a nominal fee of INR1650/-, you can opt for this examination to further enhance your credentials and stand out in the competitive job market.
5. **Government of India Recognized Certificate:** Upon successful completion of the course, you will receive a prestigious certificate recognized by the Government of India, affirming your proficiency in bioinformatics analysis.
6. **Guidance for Research Publication:** We understand the importance of contributing to the field of bioinformatics. Our expert faculty members provide guidance and support for your research endeavors, facilitating publication in reputable journals and conferences.



MODULE : 1

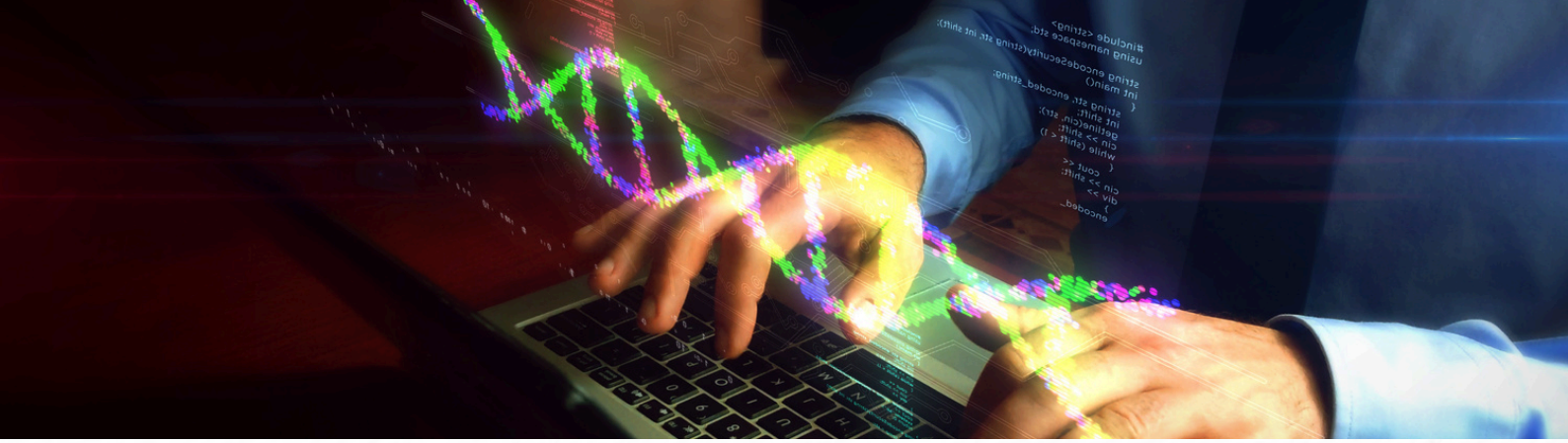
BIOINFORMATICS BASICS: CONCEPTS AND APPLICATIONS

- Introduction to Bioinformatics and its Applications in Life Sciences
- Types of sequencing and NGS introduction
- Introduction to NGS applications

MODULE : 2

BIOINFORMATICS DATABASES: AN INTRODUCTORY GUIDE

- Overview of NCBI and Its Resources
- NCBI Gene Database Exploration
- UCSC Genome Browser: Overview
- UCSC Genome Browser Hands-on Exercises
- Introduction to PubMed Database
- Overview of ClinVar Database
- KEGG Database: Overview and Practical Exercises
- Protein Databases (UniProt)
- Protein Databases (PDB)
- Introduction to Ensembl Database



MODULE : 3

COMPUTATIONAL TOOLS IN BIOINFORMATICS: APPLICATIONS AND USES

- Introduction to Online BLAST with Practical Exercises
- Setting Up Standalone BLAST and Hands-on Exercises
- Advanced Standalone BLAST Applications and Exercises
- Multiple Sequence Alignment Using CLUSTALW
- Multiple Sequence Alignment Using MEGA

MODULE : 4

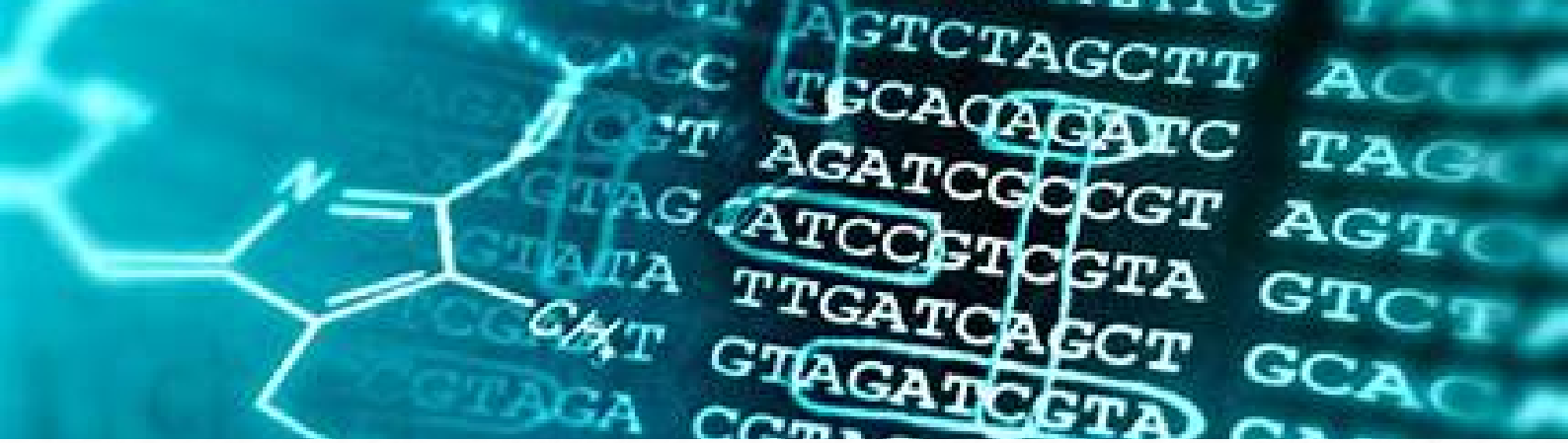
LINUX FOR BEGINNERS: A PRACTICAL GUIDE

- Introduction to Linux: Overview and Installation
- Essential Linux Commands for Beginners
- Advanced Linux Command-Line Techniques
- Managing Packages in Linux
- Bash Scripting, AWK and SED

MODULE : 5

PYTHON ESSENTIALS FOR BIOINFORMATICS

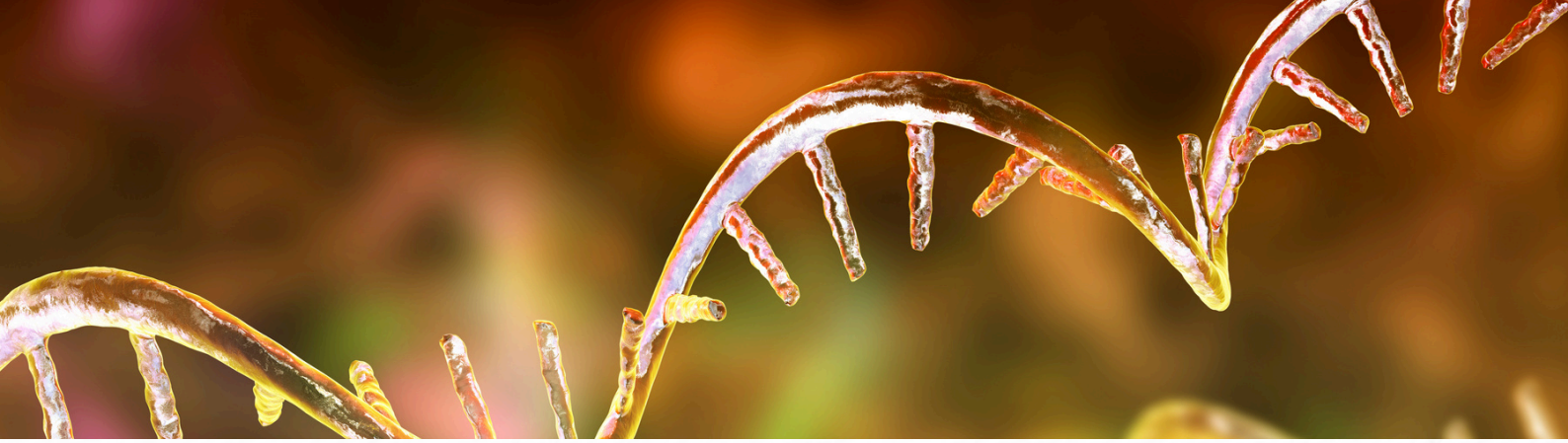
- Installation and Environment Setup
- Data Types in Bioinformatics Computing
- String Handling for DNA and Protein Sequences
- Efficient Data Structures for Biological Data
- Control Structures for Genome Data Processing
- Functions for Automating Bioinformatics Tasks
- Importing, Exporting, and Handling Biological Files
- Data Manipulation for Sequence and Expression Analysis
- Visualization of Genomic and Proteomic Data
- Biopython for Sequence and Structural Analysis



MODULE : 6

R PROGRAMMING FOR BIOLOGICAL DATA ANALYSIS

- Getting Started with R for Bioinformatics
- Understanding Data Types in R
- Efficient Data Structures for Genomic Data
- Importing, Exporting, and Handling Biological Data
- Control Structures for Data Processing in R
- Functions for Automating Bioinformatics Workflows
- Managing and Utilizing R Packages for Analysis
- Sequence Analysis with Bioconductor
- Data Manipulation for Genomic and Expression Data
- Visualizing Biological Data with R



MODULE : 7

VARIANT CALLING PIPELINE: A DNA-SEQ APPROACH

- Introduction to NGS and DNAseq
- Basic Terminologies in NGS
- Understanding of SRA database
- Installing Tools in Linux for Variant Calling
- Quality Control of Reads
- Trimming and Filtering Reads
- Genome Indexing and Read Alignment
- Variation calling using GATK
- Predicting Variant Effects
- Variation Visualization (IGV)

MODULE : 8

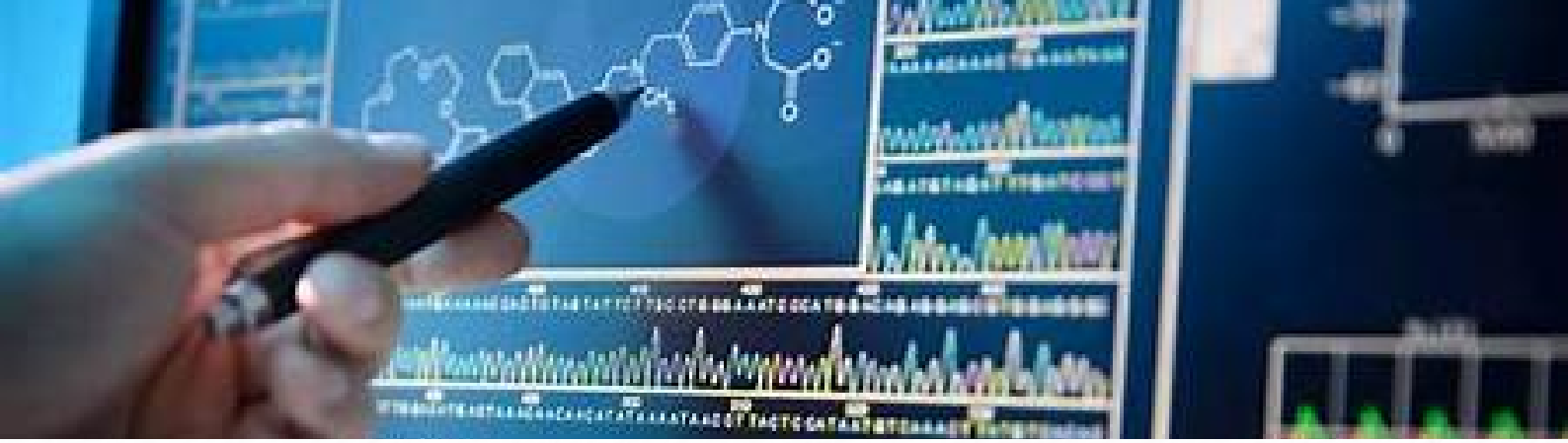
REFERENCE-GUIDED RNA-SEQ: A COMPLETE ANALYSIS WORKFLOW

- Introduction to RNA-seq and Key Terminologies
- Setting Up Tools in Linux for Gene Expression Analysis
- Quality Control and Read Trimming
- Genome Indexing and Read Alignment
- Data Normalization Using Cufflinks
- Merging Data and Identifying Differentially Expressed Genes
- Interpretation of DEG Results
- Annotation of Differentially Expressed Genes
- Functional and Pathway Enrichment Analysis
- Network Analysis of Gene Interactions

MODULE : 9

DE NOVO RNA-SEQ: TRANSCRIPTOME ASSEMBLY AND ANALYSIS

- Setting Up Tools for De Novo RNA-seq(Trinity)
- Setting Up Tools for De Novo RNA-seq(RSEM/edgeR/Assembly-stats)
- Data Downloading and Quality Control
- Transcriptome Assembly creation
- Estimating Abundance Counts
- Generating Count Matrix and Identifying DEGs
- Performing BLAST Analysis
- Interpretation of DEG Results
- Annotation of Differentially Expressed Genes
- Enrichment Analysis of DEGs



MODULE : 10

TARGETED MICROBIOME PROFILING: A METAGENOMIC APPROACH

- Introduction to Metagenomics Analysis
- Setting Up Tools for Metagenomics
- Data Downloading and Preprocessing
- Quality Control and Read Trimming
- Importing Data into QIIME2
- Quality Assessment Using DADA2
- Phylogenetic Diversity Analysis of Microbial Communities
- Taxonomic Classification of Sequences
- Visualization with Krona Plot
- Phylogenetic tree construction using MEGA

MODULE : 11

MICROARRAY-BASED GENE EXPRESSION PROFILING

- Introduction to Microarray Technology- Part1
- Introduction to Microarray Technology-Part2
- Data Downloading and Preprocessing
- Microarray Processing Pipeline up to Normalization
- Differential Gene Expression Analysis in Microarray
- Annotation of Differentially Expressed Genes
- Enrichment Analysis of DEGs
- Network Analysis of Gene Interactions
- Visualization with Volcano Plot
- Heatmap Generation for DEG Representation

MODULE : 12

INTRODUCTION TO MACHINE LEARNING IN BIOINFORMATICS

- Fundamentals of Machine Learning for Genomic Data
- Linear Models and Nearest Neighbors for Pattern Recognition
- Probabilistic Machine Learning Concepts and Applications
- Support Vector Machines SVM Theory and Implementation
- Naïve Bayes Classifier Fundamentals and Bioinformatics Use Cases
- Decision Trees and Random Forest Interpretable ML Models
- Logistic Regression for Predictive Analysis in Bioinformatics
- Clustering Algorithms for Unsupervised Learning
- Validation Techniques for Machine Learning Models
- Machine Learning for Biomedical Image Analysis

MODULE : 13

DATA PREPARATION AND STATISTICAL ANALYSIS IN BIOINFORMATICS

- Introduction to Statistical Methods for Bioinformatics
- Descriptive Statistics and Data Structures
- Correlation and Regression Analysis for Genomic Data
- Probability and Bayes Theorem in Bioinformatics
- Sampling Techniques and Distribution Theory
- Hypothesis Testing for Data Analysis
- Statistical Tools for Data Management, Analysis, and Visualization
- Inferential Statistics for Biological Data Interpretation
- Interpreting Statistical Outputs for Decision Making
- Practical Applications of Statistical Methods in Bioinformatics

MODULE : 14

BASICS OF ALGORITHM DEVELOPMENT AND IMPLEMENTATION

- Program Design: Principles and Methods
- Basic Structures for Algorithm Development
- Efficient vs Naïve Algorithms
- Structured Programming and Divide and Conquer
- Object -Oriented Approaches and Greedy Algorithms

MODULE : 15

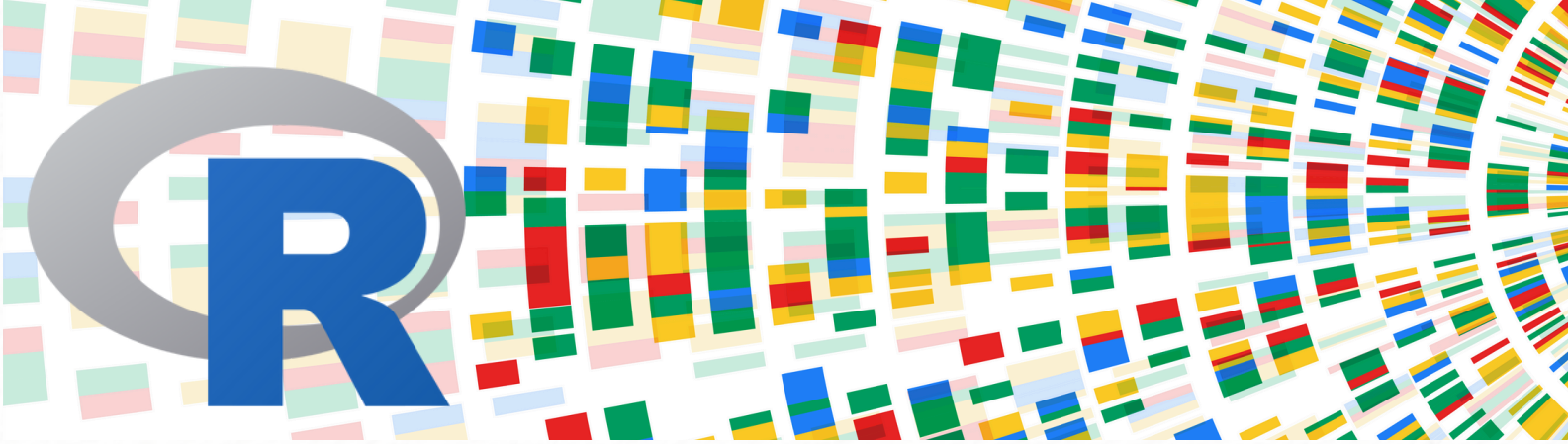
AWS- CLOUD COMPUTINGCLOUD COMPUTING FOR GENOMICS (AWS)

- Introduction to AWS
- Introduction to Compute Storage Databases
- Introduction to AWS Services NetworkingSecurity
- Deployment Strategies on AWS
- Management Tools for Bioinformatics Workflows on AWS

MODULE : 16

SQL FOR BIOINFORMATICS

- Basic SQL Syntax and Data Types
- Relational Databases and Data Operations
- SQL for Data Import, Export, and Manipulation
- Working with SQL Files and Query Execution
- SQL Workbench for Bioinformatics Data Analysis



MODULE : 17

CHEMINFORMATICS IN BIOINFORMATICS

- Drug Discovery and Development Process: Understanding QSAR Principles
- Introduction to Drug Discovery Process
- Role of Computational Methods
- Utilizing Biological Databases and GCP Standards
- Chemical Structure Visualization
- Visual Representation of Biological Processes and Structures in Data Analysis
- Biomolecules- Properties and function
- Molecular Docking and Molecular Dynamics
- Pharmacophore Modeling
- Pharmacophore Modelling applications

MODULE : 18

EMPLOYABILITY SKILLS

MODULE : 19

WORK MANAGEMENT

MODULE : 20

MANAGE YOUR WORK TO MEET REQUIREMENTS

MODULE : 21

WORK EFFECTIVELY WITH COLLOGUES

MODULE : 22

BUILD AND MAINTAIN RELATIONSHIP AT WORKPLACE

MODULE : 23

BUILD AND MAINTAIN CLIENT SATISFACTION

MODULE : 24

RESEARCH PUBLICATION GUIDANCE

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Join Us in Shaping the Future of Bioinformatics!

Embark on a journey of discovery and innovation with our LSSSDC certified Bioinformatics Analyst course. Whether you're a seasoned professional or a recent graduate, our program caters to individuals at all stages of their career. Take the first step towards a rewarding career in bioinformatics and unlock a world of opportunities.

Why Choose Our Course?

1. **Accredited Certification:** Our program is certified by the Life Sciences Sector Skill Development Council (LSSSDC), ensuring that your credentials are recognized and respected by industry professionals worldwide.
2. **Expert Faculty:** Learn from seasoned experts in bioinformatics analysis who bring real-world experience and cutting-edge insights to the classroom.
3. **Hands-On Learning:** Gain practical skills through interactive workshops, case studies, and projects that simulate real-life scenarios, allowing you to apply theoretical knowledge to practical applications.
4. **Comprehensive Curriculum:** Covering key topics such as sequence analysis, genomics, proteomics, and more, our curriculum is meticulously crafted to provide you with a well-rounded understanding of bioinformatics principles and techniques.
5. **Career Support:** Receive personalized career guidance and support from our dedicated team, including resume building, interview preparation, and job placement assistance, to help you kickstart your career in bioinformatics.
6. **Networking Opportunities:** Connect with fellow aspiring bioinformatics analysts, industry professionals, and mentors to expand your professional network and stay updated on the latest trends and developments in the field.

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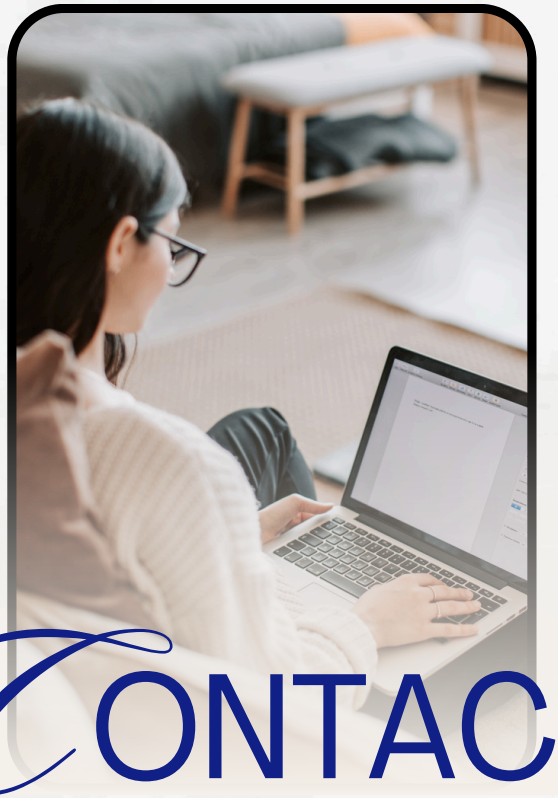

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thank you!

OUR CERTIFICATIONS & GRANTS

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