TECH BOOSTER ®
Education Pvt. Ltd

2 DAYS WORKSHOP ON

AI IN BIOINFORMATICS AND DRUG DISCOVERY

BY TECH BOOSTER

JOIN NOW AND TAKE A STEP TOWARDS YOUR DREAM CAREER

CONTENTS ..... Day1 (AI IN BIOINFORMATICS AND DRUG DISCOVERY)

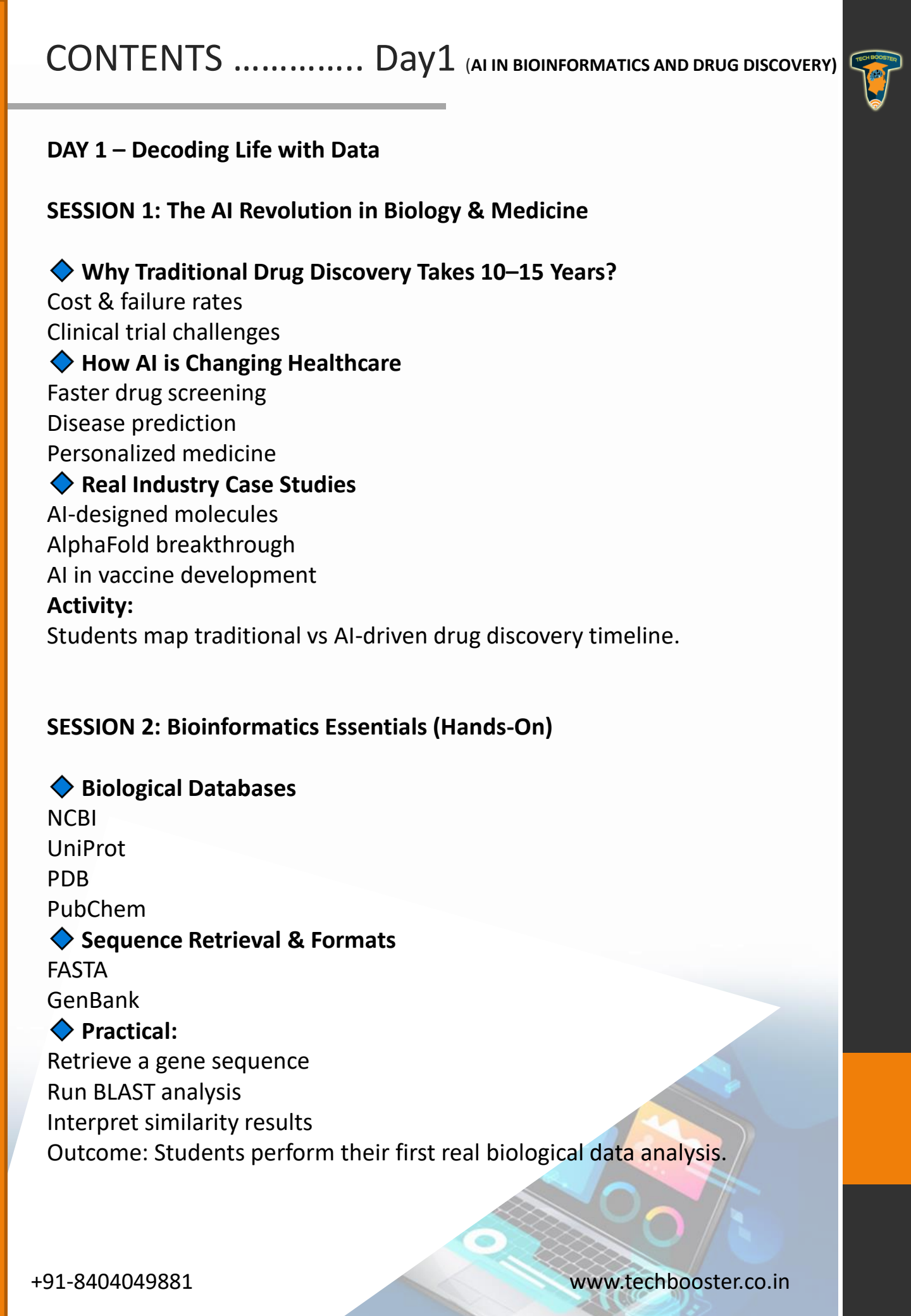
DAY 1 – Decoding Life with Data

SESSION 1: The AI Revolution in Biology & Medicine

🔷 **Why Traditional Drug Discovery Takes 10–15 Years?**
Cost & failure rates
Clinical trial challenges
🔷 **How AI is Changing Healthcare**
Faster drug screening
Disease prediction
Personalized medicine
🔷 **Real Industry Case Studies**
AI-designed molecules
AlphaFold breakthrough
AI in vaccine development
Activity:
Students map traditional vs AI-driven drug discovery timeline.

SESSION 2: Bioinformatics Essentials (Hands-On)

🔷 **Biological Databases**
NCBI
UniProt
PDB
PubChem
🔷 **Sequence Retrieval & Formats**
FASTA
GenBank
🔷 **Practical:**
Retrieve a gene sequence
Run BLAST analysis
Interpret similarity results
Outcome: Students perform their first real biological data analysis.



CONTENTS ..... Day1 Contd.

SESSION 3: Introduction to AI & Machine Learning

🔷 **ML Concepts Made Simple**
Supervised Learning
Classification vs Regression
Clustering
🔷 **Biological Use Cases**
Toxicity prediction
Disease classification
Gene expression analysis

Hands-on:
Basic ML demo in Google Colab
Simple classification example

SESSION 4: Protein Structure & AI

🔷 **Why Protein Structure Matters in Drug Discovery**
🔷 **AlphaFold & Structure Prediction**
🔷 **Visualization using:**
PyMOL / Online viewers

Practical:
Students visualize a protein and identify active site regions.

CONTENTS ..... Day2 (AI IN BIOINFORMATICS AND DRUG DISCOVERY)

SESSION 5: AI in Drug Discovery Pipeline

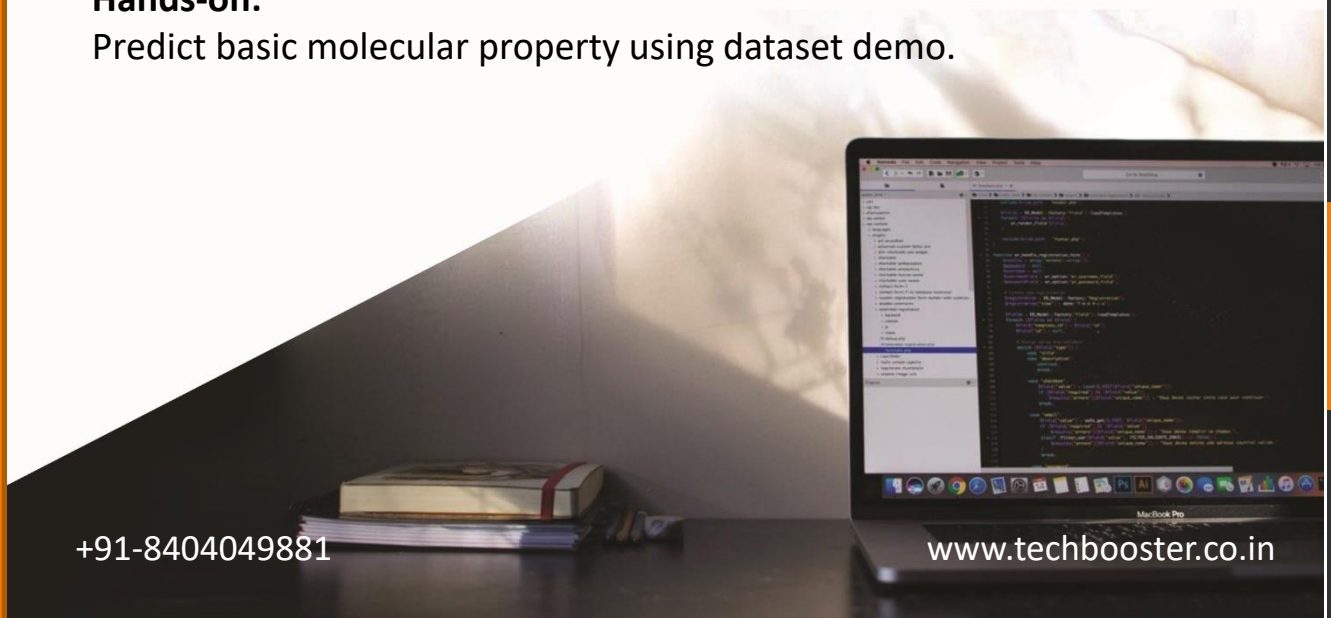
🔷 **Target Identification**
Genomics data
Network biology
🔷 **Virtual Screening**
Structure-based design
Ligand-based design
🔷 **De Novo Drug Design**
Generative AI concept
VAEs & GANs (conceptual overview)

Activity:
Students screen mock compounds dataset.

SESSION 6: ADMET & Drug Safety Prediction

🔷 **What is ADMET?**
Absorption
Distribution
Metabolism
Excretion
Toxicity
🔷 **AI in Toxicity Prediction**
🔷 **Drug-Drug Interaction Prediction**

Hands-on:
Predict basic molecular property using dataset demo.



CONTENTS ……. Day2 Contd.

SESSION 7: AI in Clinical Trials & Personalized Medicine

- **AI in Patient Recruitment**
- **Biomarker-based trials**
- **Outcome prediction models**

Case Study Discussion:
“Would this drug pass Phase 3 trial?”

🎓 **SESSION 8: Mini Capstone Project**
Students choose one:
Sequence Analysis Project
Build a simple ML classifier
Target prediction exercise
ADMET prediction mini model

Presentation + Certificate Distribution