Ramaq Chools
Consulting, Training & IT Services

Health care and Pharmaceutical

INDUSTRIAL BIOTECHNOLOGY

Curriculum

Program Outline :

Module 1:Fundamentals of Industrial Biotechnology

1.Introduction to Industrial Biotechnology: Understanding the basic
concepts, history, and applications of industrial biotechnology.

2.Microbial Strain Development: Learning about the development and optimization of microbial strains for industrial applications.

3.Biochemical Pathways: Studying biochemical pathways and their relevance to industrial processes.

4.Chemical Reaction Kinetics: Understanding the principles of chemical reaction kinetics and their application in bio processes.

5.Types of Reactors: Exploring different types of reactors used in industrial biotechnology and their analysis

Module 2:Advanced Industrial Biotechnology

1.Advanced Bioprocess Engineering: Exploring advanced topics in bioprocess engineering, including process design, scale-up, and optimization.

2.Metabolic Engineering: Understanding metabolic engineering principles

to modify and optimize microbial metabolic pathways for industrial applications.

3.Synthetic Biology: Learning about synthetic biology techniques to design and construct new biological parts, devices, and systems.

4.Genetic Engineering: Gaining expertise in genetic engineering tools and
techniques for modifying organisms to produce desired products.

5.Bioreactor Design and Operation: Delving into advanced bioreactor design, operation, and control strategies for industrial-scale production.

Module 3:Practical Applications

1**.Case Studies and Simulations:** Analyzing real-world case studies and participating in simulations to understand the challenges
and intricacies of industrial biotechnology applications.

2.Bioprocess Scale-Up: Gaining hands-on experience in scaling up bioprocesses from lab-scale to industrial-scale production.

3.Bioreactor Operation and Control: Implementing advanced bioreactor operation and control strategies to ensure process stability and product quality.

4.Downstream Processing Techniques: Applying advanced downstream processing techniques for the purification, separation, and recovery of bioproducts.

Module 4: Capstone Project

1.Project Proposal: Developing a detailed proposal outlining the objectives, methodology, and expected outcomes of the project.

2.Research and Data Collection: Conducting thorough research and collecting data relevant to the chosen topic.

3.Implementation: Applying advanced industrial biotechnology knowledge and skills to execute the project.

4.Analysis and Evaluation: Analyzing the results and evaluating the impact of the project on industrial biotechnology practices and outcomes.

5.Presentation and Defense: Presenting the findings and defending the project in front of a panel of experts.

Elective Modules

Regulatory Affairs: Focus on the intricacies of regulatory submissions, interactions with regulatory agencies, and staying current with regulatory changes.

Clinical Data Management: Specialize in managing clinical trial data, ensuring data integrity, and utilizing advanced data analysis techniques.

Pharmacovigilance: Learn about the detection, assessment, understanding, and prevention of adverse effects or any other drug-related problems.

Quality Risk Management: Develop expertise in identifying, assessing, and managing risks related to drug development and ensuring continuous quality improvement.

Websites:

- https://chools.in/
- https://ramaqchools.com/
- https://www.choolsgroup.com/