BioProcess Digital

PROFESSIONAL COURSES IN BIOPROCESS ENGINEERING

Microbial fermentation processes - Optimize fermentors operation

Industrial fermentation processes. Microbial kinetics. Oxygen and CO2 in fermentors. Optimal operation of batch, continuous and fed-batch fermentations

ONLINE COURSE

On-demand

COURSE FEE

350 € per session

COURSE ORGANIZATION

Course divided in 6 sessions

Sessions can be taken individually

Session scheduling: suggested one per week

Effort: 3 - 6 h per session

COURSE DESCRIPTION

The course provides a comprehensive overview of industrial fermentation processes, including their technologies, operations, scale-up, and cost optimization. It reviews the kinetics of microbial transformations, the solubilities and transfer kinetics of oxygen and CO_2 in fermentors. It provides in-depth insights into the optimal operations of batch, continuous and fed-batch fermentations.

The course features a combination of methodological presentations and fermentations case studies.

INSTRUCTOR

Jean-Marc Engasser, BioProcess Digital

DIGITAL LEARNING

- Learning platform with course resources
- Live or recorded slideshow videos
- Case studies on spreadsheets templates with guides
- Online collective or one-to-one tutoring

COURSE PROGRAM

Session 1: Industrial fermentation processes

Microorganisms, media, products. Process operations. Fermentors technologies and operations.Fermentation costs

Session 2: Microbial fermentation kinetics

Kinetic analysis in batch and continuous fermentors. Microbial kinetic laws. Industrial fermentations kinetics

Session 3: Oxygen and CO_2 in fermentors

Fermentors aeration technologies. Solubilities and transfer kinetics. Determination of transfer coefficient k_la

Session 4: Batch fermentations optimal operation

Batch fermentation principles, kinetics and productivities. Optimization of anaerobic and aerobic fermentations

Session 5: Continuous fermentations optimal operation

Continuous fermentation principles. Dynamic and steady-state kinetics. Optimization of anaerobic and aerobic fermentations

Session 6: Fed-batch fermentations optimal operation

Fed-batch fermentation principles, operation and kinetics, Optimization of aerobic fermentations