

## The GUNT learning concepts of biological process engineering

## What does biological process engineering deal with?

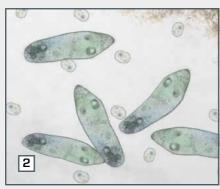
Biological process engineering deals with biological mass transformation. The following agents carry out this mass transformation:

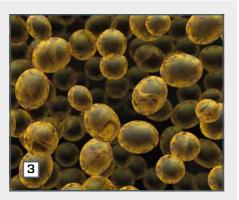
- complete living organisms with one or a few cells, such as bacteria, fungi or algae
- biologically active, isolated components of organisms, such as animal or plant cells
- biologically active, isolated components of cells, such as enzymes

Biological process engineering has to create optimal conditions for these organisms, cells and cell components. The scientific findings from the areas of biology, biochemistry, etc. are implemented in industrial-scale processes. Examples of typical processes are:

- lacksquare production of drugs
- production of chemicals
- $\hfill\blacksquare$  production of food
- decontamination of soil, air and wastewater
- $\,\blacksquare\,$  production of biomass energy sources

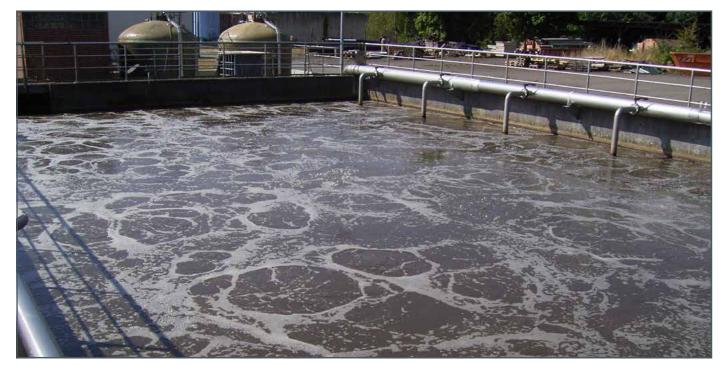






Examples of agents in biological process engineering:

<sup>1</sup> Aspergillus niger: mould fungus used for the production of citric acid, 2 Paramecium: Microorganism for biological wastewater treatment, 3 Saccharomyces cerevisiae: yeast for the production of ethanol



Biological treatment stage on a wastewater treatment plant (aeration tank)

## Our training systems for biological process engineering

Aerobic processes	CE 701 Biofilm process CE 704 SBR process CE 705 Activated sludge process CE 730 Airlift reactor
Anaerobic processes	CE 702 Anaerobic water treatment CE 640 Biotechnical production of ethanol CE 642 Biogas plant

## Aerobic and anaerobic processes

An important distinguishing factor for biological processes is whether the microbiological processes take place under aerobic or anaerobic conditions. Biological process engineering has the task of creating the best possible ambient conditions for the respective microorganisms. In the case of fastidious anaerobic microorganisms this is the absence of oxygen. For aerobic microorganisms, on the other hand, an adequate and constant supply of oxygen must be ensured.

In the case of aerobic metabolism, the energy gain of the microorganisms is higher than during anaerobic metabolism. The aerobic microorganisms reproduce more quickly accordingly and there is more biomass.



PLC with touch screen



CE 642 Biogas plant

173