

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:

- production of drugs
- production of chemicals
- production of food
- decontamination of soil, air and wastewater
- production of biomass energy sources



Examples of agents in biological process engineering:

A *Aspergillus niger*: mould fungus used for the production of citric acid, **B** *Escherichia coli*: bacterium for the production of insulin, **C** *Saccharomyces cerevisiae*: yeast for the production of ethanol

HOW CAN THE BIOLOGICAL PROCESSES BE CLASSIFIED?

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.

The biological process...	...and the appropriate GUNT unit
Aerobic Processes	<ul style="list-style-type: none"> ▶ CE 701 <i>Biofilm Process</i> ▶ CE 705 <i>Activated Sludge Process</i> ▶ CE 730 <i>Airlift Reactor</i>
Anaerobic Processes	<ul style="list-style-type: none"> ▶ CE 702 <i>Anaerobic Water Treatment</i> ▶ CE 640 <i>Biotechnical Production of Ethanol</i> ▶ CE 642 <i>Biogas Plant</i>



Perfect conditions for microorganisms...

... and for students!