



## COURSE DATASHEET

<b>Semester:</b>	2015/16/2
<b>Course:</b>	Bioreactors
<b>Code:</b>	VEMKMUB312B
<b>Responsible department:</b>	Research Institute on Bioengineering, Membrane Technology and Energetics
<b>Department code:</b>	MKBME
<b>Responsible instructor:</b>	dr. Béla Nándor Nemestóthy

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### Course objectives:

Introduction to the special bioreactor constructions used in the biotechnical industry.

### Course content:

1. Construction and classification of bioreactors.
2. Main parts of fermentors.
3. Transport phenomena in bioreactors: oxygen balance, oxygen transfer.
4. Formation kinetics in bioreactors.
5. The chemostat: continuous, ideally stirred bioreactor.
6. Aerob bioreactors with mechanic stirring.
7. Loop reactors and bubble columns.
8. Anaerob bioreactors.
9. Multiphase bioreactors.
10. Reactors with immobilized enzymes and cells. The role of diffusion.
11. Sterilizing bioreactors.
12. Membrane bioreactors.
13. Measurement and regulation in bioreactors.
14. Cost approximation of bioreactors.

### Requirements, evaluation and grading:

Terms of signature: In the theoretical subject an individual exercise (simulation assignment) is expected to solve and to present.

### Required and recommended readings:

Schügerl K.: Bioreaction Engineering vol. II. John Wiley and Sons, 1987.

Douglas S. Clark: Biochemical Engineering, Marcel Dekker Inc. 1997.