

# **LEARNING BY DOING: INTEGRATING BIOLOGICAL ENGINEERING AND UNDERGRADUATE EDUCATION**

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Microorganisms are biotechnologically applicable in medicine, agriculture and industry. More precisely, microbial utility includes e.g. the ancient usage in brewery, the production of high value compounds or wastewater treatment, sometimes under very extreme conditions. While the original principles remain the same, a high degree of optimization and e.g. modern computer-guided control and monitoring facilitate new or improved bioprocesses.

Since 2014, students from Mittweida University of Applied Sciences volunteer to participate in the annual 99€-Bioreactor challenge hosted by the Netzwerk Bioverfahrenstechnik Dresden e.V.. Each year, there is a new and different challenge. Integrating and applying their biological and engineering knowledge, the volunteering students construct a bioreactor to face off against competing teams. Here we present a review of the past five years of hands-on engineering conducted by biotechnology undergraduates.