

Laboratory Biochemical Engineering for Incomings (part of Module BTB-0336)

1	Module Number part of 0336	Study Programme BTB	Semester 4	Offered in ⊠WS ⊠SS	Duration 1 Semester	Module Type compulsory	Workload (h) 120	ECTS Points 4
2	Courses		Teaching and Learning Forms		Contact Time		Self-Study Time	Language
					(SWS)	(h)	(h)	
	Laboratory Biochemical Engineering		Lab		4	60	60	German or English
3	Learning Outcomes and Competences Once the module has been successfully completed, the students can							
	 Knowledge and Understanding understand the interrelationships within biochemical engineering. describe the typical design, equipment and sterile features of bioreactors. 							
	Use, Application and Generation of Knowledge							
	 Use and Transfer cultivate microorganisms in modern bioreactors with the associated media production, analytics, control and sterile technology. characterize bioreactors in terms of mixing time, power input, kLa values. 							
	 Scientific Innovation transfer the learned methods and the acquired knowledge to new bioprocesses. 							
	 Communication und Cooperation evaluate, present and interpret the data of a bioprocess and draw admissible conclusions. write reports on their own scientific results. report on scientific results. Scientific Self-Conception/ Professionalism justify the solution theoretically and methodically. reflect and assess one's own abilities in a group comparison. 							
4	Contents Lab: safety issues in biological laboratories practical training with bioreactors for the cultivation of microorganisms (preparation of growth media (complex and defined media); sterile technology; cultivation of microorganisms; feeding strategies for fed-batch bioprocesses; measurement of offline und online parameters for the analysis of the cultivation process; determination of the specific growth rate and the specific substrate uptake rate and product formation rate; determination of yield coefficients) characterization of bioreactors (determination of the kLa-value, mixing time and power input) measurement and control of bioreactors cell harvest and disintegration							
5	Participation Requirements							
	compulsory: Modules Basic process engineering, lab microbiology, Bioprocess engineering principles or equivalent knowledge							
6	Examination Forms and Prerequisites for Awarding ECTS Points							
	all experiments passed successfully with reports							
/	Further Use of Module							
0	Module Manager and Full-Time Lecturer							
0	Prof. Dr. Richard Biener							
9	Literature							
	H. Chmiel, R. Takors, D. Weuster-Botz: Bioprozesstechnik. 4. Auflage. Springer Spektrum, Berlin 2018							
	V. Hass, R. Pörtner: Praxis der Bioprozesstechnik. 2. Auflage. Springer Spektrum, Berlin 2011							
	W. Storhas: Bioverfahrensentwicklung. 2. Auflage. Wiley-VCH, Weinheim 2013							
	Lecture notes (german) and lab notes (german and englisch)							
10	Last Updated 14.01.2023							