

Course Unit Descriptor

Study Programme: Biotechnology			
Course Unit Title: Bioprocess Equipment			
Course Unit Code: O6BIO2			
Name of Lecturer(s): Associate Professor Damjan Vučurović, Associate Professor Bojana Bajić			
Type and Level of Studies: Bachelor Academic Degree			
Course Status (compulsory/elective): Compulsory			
Semester (winter/summer): Summer			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face			
Number of ECTS Allocated: 6			
Prerequisites: None			
Course Aims: Acquiring the necessary knowledge about the basic characteristics of the equipment used in biotechnological production, its application, specificity and calculations as a basis for bioprocess design.			
Learning Outcomes: Practical and theoretical understanding of the specific characteristics and application of equipment in biotechnological production, knowledge of the legality of the operation of that equipment, calculation of the basic parameters of individual units of bioprocess equipment.			
Syllabus: <i>Theory</i> Classification and specifics of bioprocessing equipment. Vessels in biotechnology (characteristics, application, calculation). Valves in biotechnology (characteristics, application, calculation). Pumps in biotechnology (characteristics, application, calculation). Energy systems in biotechnology (steam and cooling water systems, cooling towers). Systems for bioprocessing equipment cleaning. Systems for bioprocessing equipment sterilization. Systems for heating, ventilation and air conditioning. Measurement and regulation equipment in biotechnology. <i>Practice</i> Computational and experimental exercises in the field of calculating individual units of bioprocess equipment.			
Required Reading: 1. B. Lydersen: Bioprocess Engineering: Systems, Equipment and Facilities, John Wiley & Sons, India, 2010. 2. T. Panda: Bioreactors: Analysis and Design, Tata McGraw Hill, New Delhi, 2011. 3. H. Lim, H.S. Shin: Fed-Batch Cultures: Principles and Applications of Semi-Batch Bioreactors, Cambridge University Press, New York, 2013.			
Weekly Contact Hours: 6	Lectures: 3	Practical work: 3	
Teaching Methods: Interactive lectures using video presentations, computational and experimental exercises, consultations.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	

Test I and Test II	40	oral exam	45
Practical work	10	
Seminar(s)			
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			