Course Unit Descriptor

Study Programme: Biotechnology, Chemical engineering			
Course Unit Title: Biomass as Energy Source			
Course Unit Code: DB7			
Name of Lecturer(s): Associate Professor Damjan Vučurović, Associate Professor Bojana Bajić			
Type and Level of Studies: Doctoral Academic Degree			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): Winter/summer			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face			
Number of ECTS Allocated: 10			
Prerequisites: None			
Course Aims: The aim of the course is to provide students with academic knowledge on modern and promising technological processes for energy production on renewable biomass (bioethanol production, biodiesel, methanol, hydrogen and anaerobic digestion of waste materials for the production of methane).			
Learning Outcomes: Students are trained to establish criteria for the selection of certain raw materials (biomass sources) based on techno-economic analysis. Students will also acquire the competencies to independently conceptually design a process for producing energy based on available biomass and to adequately present their results.			
Syllabus: *Theory* Characteristics of biomass (cellulose, starch and sugar raw materials) for energy production. Technological processes for the production of energy from biomass. Energy resources - the current situation and perspectives. Bioethanol as a fuel and production technology. Biodiesel as fuel and production technology. Hydrogen as a fuel and its production. Production of methane by anaerobic digestion of biological waste. *Practice* Searching through scientific literature, processing, analysis and discussion of the latest knowledge in this field.			
Required Reading: 1. Sunggy Lee, Y.T. Shah: Biofuels and Bioenergy: Processes and Technologies, CRC Press, 2013. 2. Debalina Sengupta, Ralph W. Pike: Chemicals from biomass: Integrating bioprocesses into chemical production complexes for sustainable developement, CRC Press, 2013. 3. Shang-Tian Yang: Bioprocessing for Value-Added Products from Renewable Resources: New Technologies and Applications. Elsevier, 2007.			
Weekly Contact Hours: 6	**Lectures:** 4	**Practical work:** 2	
Teaching Methods: Interactive lectures and consultations in a group or independently depending on the number of students; computer work, use of the internet, creation and presentation of seminar.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	**Final exam**	points

Active class participation		written exam	
Practical work		oral exam	50
Preliminary exam(s)		…….	
Seminar(s)	50		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			