

Study Program: Pharmaceutical engineering		
Course Unit Title: Chapters of surfactants and detergents technology		
Course Unit Code: DSFI03		
Name of Lecturer(s): Assoc. Prof. Lidija Petrović, PhD; Ass. Prof. Jadranka Fraj, PhD		
Type and Level of Studies: Master Academic Studies		
Course Status (compulsory/elective): Elective		
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: 10		
Prerequisites: None		
<p>Course Aims:</p> <p>Acquiring theoretical and practical knowledge in the field of surface activity and interface phenomena in systems of complex composition containing surfactants. Detailed knowledge of the physicochemical properties of the newer generation of surfactants and other components that are part of the personal care products, cosmetic and pharmaceutical products, the way they act, the possible interactions and the effects that are achieved with them.</p>		
<p>Learning Outcomes:</p> <p>Training students for independent and creative work on solving theoretical and practical problems related to the creation of new products based on surfactants.</p>		
<p>Syllabus:</p> <p><i>Theory</i></p> <p>Newer generation of surfactants, surface activity, micellization, phase behavior of the surfactant in solutions, phase diagrams, HLB and PIT concept. Mixed surfactants, (emulsifiers), polymeric, gemini and silicone surfactants and bio surfactants. Technology of production of certain groups of surfactants. Adsorption and processes at the liquid/solid, Liquid/liquid and liquid/gas interfaces, the structure and properties of the layers. Rheological effects of concentrated surfactant solutions. Products based on new groups of surfactants intended for use in the cosmetics industry. Interactions of surfactants with other system components and effects that are achieved by them. Toxicological effects of surfactants, biodegradation and the impact on the ecosystem.</p> <p><i>Practice</i></p> <p>Review of scientific and professional literature, processing, analysis and discussion of the latest knowledge in the area within the seminar paper.</p>		
<p>Required Reading:</p> <ol style="list-style-type: none"> 1. K.Holmberg, Handbook of Applied Surface and Colloid Chemistry, Wiley, 2002. 2. D. Myers, Surfactant Science and Technology, Wiley, 2006. 3. T.Tadros, Applied Surfactants, Wiley, 2005. 4. E. Smulders, Lundry Detergents, Wiley, 2002. 		
Weekly Contact Hours:	Lectures: 4	Practical work: 2

Teaching Methods:

Interactive lectures or consultations, depending on the number of students.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	Final exam	points
Active class participation	-	written exam	-
Practical work	-	oral exam	60
Preliminary exam(s)	-	
Seminar(s)	40		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.