

Study program: Integrated academic studies of Pharmacy			
Type and level of the study program: integrated academic studies			
Course title: BASIC RHEOLOGY (PhIV-BRHEO)			
Teacher: Veljko S. Krstonošić			
Course status: elective			
ECTS Credits: 3			
Condition: -			
Course aim Theoretical and practical knowledge of the basic assumptions and the importance of rheology. Introduction to the rheological behavior and specific characteristics of different systems. Gaining knowledge about the ways of determining the rheological parameters and the interpretation of results.			
Expected outcome of the course: Fundamental knowledge of the rheological behavior of the systems which are base for the pharmaceuticals. Application of theoretical knowledge in practice.			
Course description <i>Theoretical education</i> <ol style="list-style-type: none"> 1. Newtonian and non-Newtonian systems. 2. Scope and definition of rheology. 3. Rheological models. 4. Classification of the systems, the main properties. Types of flow and equations. 5. Viscoelastic systems. Creep and recovery. 6. Rheological measurements. Determination of flow curve and fitting parameters. 7. Yield stress, definition and determination. 8. Oscillatory measurements. 9. Viscometers and rheometers. 10. Rheological modifiers in pharmacy. <i>Practical education: exercises, other forms of education, research related activities</i> <ol style="list-style-type: none"> 1. Determination of flow curves and graphical presentation of results systems: dilute solutions of macromolecules, emulsions suspensions, gels. 2. Determination of flow parameters. 3. Oscillatory measurements of the systems: dilute solutions of macromolecules, emulsions suspensions, gels. 4. Application of the theoretical knowledge to the modeling of rheological systems. 			
Literature <i>Compulsory</i> <ol style="list-style-type: none"> 1. Lj. Đaković : “Colloid chemistry”, Zavod za udžbenike i nastavna sredstva, Belgrade, 2006. (translated selected chapters from Serbian) 2. T. Mezger: “Applied rheology”. Anton Paar GmbH, Austria, 2015. 3. H. Barnes: “A Handbook of Elementary Rheology”, Institute of Non-Newtonian Fluid Mechanics, University of Wales, 2000. 4. G. Schramm: “A Practical Approach to Rheology and Rheometry”, Gebrueder HAAKE GmbH, Karlsruhe, 2000. <i>Additional</i> <ol style="list-style-type: none"> 5. J. Steffe: “Rheological Methods in Food Process Engineering”, Freeman Press, USA, 1996. 			
Number of active classes			Other:
Lectures: 30	Practice: 15	Other types of teaching: Research related activities:	
Teaching methods Lectures, practical classes			
Student activity assessment (maximally 100 points)			
Pre-exam activities	points	Final exam	points
Lectures	10	Written	
Practices		Oral	50
Colloquium	20	
Essay	20		