

COURSE/MODULE DESCRIPTION (SYLLABUS)

1.	Course: Drug Carriers
2.	Language of instruction: English
3.	Faculty: Faculty of Biotechnology
4.	Course code: 29-BT-S2-E3-Dc
5.	Course/module type (<i>mandatory or elective</i>): Mandatory
6.	Programme: Medical Biotechnology
7.	Study cycle: 2nd cycle
8.	Year: 2nd year
9.	Semester (<i>autumn or spring</i>): autumn
10.	Form of tuition and number of hours lecture , 15h
11.	Name, Surname, academic title Jerzy GUBERNATOR, PhD
12.	Initial requirements (knowledge, skills, social competences) regarding the course/module and its completion: When starting to learn this subject, the student should have information (completed courses) in the field of: Physical Chemistry, Chemistry, Biochemistry, Immunology, Genetics and Molecular Biology. The student is able to collect and interpret experimental data and on this basis to synthesize and formulate appropriate conclusions.
13.	Objectives: Familiarization with modern drug carriers including liposomes, polymeric micelles, dendrimeres, polymeric nanoparticles, microemulsions, and others. The lecture contains informations about methods of their preparation, characteristics and practical applications, especially in pharmacy and medicine. Comparison of particular types of nanocarriers. Practical demonstration of applications of nanocarriers in therapy of human diseases.

14.	<p>Content:</p> <p>The fate of the free drug and drug carriers after intravenous injection. Presentation of the most popular drug carriers like polymeric micelles, dendrimeres, polymeric nanoparticles (polylactic spheres), microemulsions, liposomes, emulsomes, solid lipid nanoparticles, nanostructured lipid nanoparticles and others. Characteristics of drugs carriers in terms of preparation methods, drug stability, pharmacokinetic properties and applications in medicine and cosmetics industry.</p>	
15.	<p>Learning outcomes:</p> <p>Student:</p> <ul style="list-style-type: none"> • possesses advanced knowledge of medical and biological sciences, namely biotechnology and biomedicine; • possesses knowledge of the current issues prevailing in scientific literature; • efficiently makes use of scientific literature in the field of biomedicine and biotechnology; • reads professional literature in English; • shows ability to formulate legitimate opinions on the basis of data derived from different sources; • understands the need for a systematic review of professional literature in order to broaden and deepen his or her knowledge; • regularly revises biotechnological knowledge and its practical applications. 	<p>Outcome symbols:</p> <p>K_W03, K_W05</p> <p>K_U02, K_U07</p> <p>K_K05, K_K07.</p>
16.	<p>Recommended literature:</p> <ul style="list-style-type: none"> • R.H. Muller, S. Benita, B. Bohm. Emulsions and nanosuspensions for the formulation of poorly soluble drugs. Medpharm Scientific Publishers Stuttgart (1998). • M. Reza Mozafari. Nanocarrier technology: frontiers of nanotherapy. Springer (2006) • G. Gregoriadis. Liposome technology. Informa Healthcare USA, Inc. (2007). • Scientific publications sent to students. 	
17.	<p>Methods of verification of the assumed learning outcomes:</p> <p>The student is assessed on the basis of a written test.</p>	
18.	<p>Conditions of earning credits:</p> <p>Exam</p>	
19.	<p>Student's workload:</p>	
	<p>Activity</p>	<p>Number of hours for the activity</p>
	<p>Hours of instruction (as stipulated in study programme) :</p> <ul style="list-style-type: none"> • lecture 	

		15 h
	Student's own work: <ul style="list-style-type: none">• reading additional literature;• preparation for the exam.	15 h
	Total number of hours:	30 h
	Number of ECTS:	2 ECTS