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-Dcl**
5.	Course/module type (*mandatory* or *elective*): **mandatory**
6.	Programme: **Medical Biotechnology**
7.	Study cycle: **2nd cycle**
8.	Year: **2nd**
9.	Semester *(autumn* or *spring):* **autumn**
10.	Form of tuition and number of hours: **Laboratory classes , 30 h**
11.	Name, Surname, academic title: **Anna JAROMIN, 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. The student is able to interact and work in a group on planning experiments and solving problems.**
13.	Objectives: **Familiarization with modern drug carriers, 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.**
14.	Content:

<table>
<tr><td></td><td colspan="2">Preparation and characterization of solid alginate and gelatin carriers containing nanocarriers. Preparation and characterization of lipid nanoemulsions. Preparation and characterization of self-emulsifying formulations. Assessment of transdermal penetration (in Franz diffusion cells) of the active substance encapsulated in the nanocarrier and the control (commercial) preparation.</td></tr>
<tr><td>15.</td><td>Learning outcomes:
Student:
• 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;
• Plans and performs research tasks and analysis under the supervision of a tutor;
• 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.</td><td>Outcome symbols:

K_W03, K_W05

K_U02, K_U04

K_K05, K_K07.</td></tr>
<tr><td>16.</td><td colspan="2">Recommended literature:
• R.H. Muller, S. Benita, B. Bohm. Emulsions and nanosuspensions for the formulation of poorly soluble drugs. Medpharm Scientific Publishers Stuttgart (1998).
• Scientific publications sent to students.</td></tr>
<tr><td>17.</td><td colspan="2">Methods of verification of the assumed learning outcomes:
The student is assessed on the basis of a written report describing the course of the exercises, observations made during their course, and the results and conclusions he received after the program was completed (2/3 of the grade). An additional component is the student's personal involvement in the work (1/3 of the grade).</td></tr>
<tr><td>18.</td><td colspan="2">Conditions of earning credits:
Continuous control of attendance, control of progress in the subject matter of classes, report.</td></tr>
<tr><td rowspan="4">19.</td><td colspan="2">Student’s workload:</td></tr>
<tr><td>Activity</td><td>Number of hours for the activity</td></tr>
<tr><td>Hours of instruction (as stipulated in study programme) :
laboratory classes</td><td>30 h</td></tr>
<tr><td>Student’s own work
• preparation for classes,</td><td>15 h</td></tr>
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	• **reading of the literature,** • **preparation of a report.**	
	Total number of hours:	**45 h**
	Number of ECTS:	**2 ECTS**