

<b>Biopharmaceutics</b>								<b>Code of the course</b>	<b>Year / Semester</b>
<b>Type of subject:</b>		<b>Education Profile</b>		<b>The level of education</b>		<b>Form of studies</b>			
obligatory		General Academic				Stationary			
<b>Type of subject</b>								<b>ECTS</b>	
<b>Lecture</b>	<b>Exercises</b>	<b>Laboratory</b>	<b>Project</b>	<b>Seminar</b>	<b>Practical classes</b>	<b>Exam</b>			
30	15	-	-	-	-	no	3		
<b>Subject coordinator:</b>									
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<b>I. SUBJECT CARD</b>	
<b>COURSE OBJECTIVE</b>	
<b>C01</b>	The goal in terms of knowledge is providing basic knowledge about classification, occurrence of pharmaceuticals and their kinetics
<b>C02</b>	The goal in terms of skills is providing of basic knowledge of biopharmaceuticals kinetics, especially their elimination by the liver and selected methods of application
<b>C03</b>	The goal in terms of social competences is to learn techniques of using biopharmaceuticals in human treatment, case study - basics of drug selection, principle of action and therapeutic effects
<b>PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES</b>	
1	General knowledge of the field of chemistry, biology of living organisms and mathematics
<b>LEARNING OUTCOMES</b>	

<b>Knowledge: student knows and understands</b>	
<b>EU1</b>	Knows the basic knowledge about classification, occurrence of pharmaceuticals and their kinetics
<b>Skills: student is able to</b>	
<b>EU2</b>	Knows the basics of biopharmaceuticals kinetics, especially their elimination by the liver and selected methods of application
<b>Social competences: Student is ready to</b>	
<b>EU3</b>	The student can use biopharmaceuticals techniques in human treatment, can create the case study - basics of drug selection, principle of action and therapeutic effects of discussed medicine substance.

<b>II. COURSE CONTENT</b>		
<b>Course type – Lecture</b>		<b>Number of hours</b>
<b>1-2</b>	Biopharmaceutics – introduction and theory principals	4
<b>3-5</b>	Introduction to biopharmaceutics and pharmacokinetics	6
<b>6-7</b>	Biopharmaceutics classification system and importance	4
<b>8-10</b>	Drug elimination and clearance	6
<b>11-12</b>	Pharmacokinetics of oral adsorption	4
<b>13-15</b>	Targeted drug delivery systems and biotechnological products	6
<b>TOTAL:</b>		<b>30</b>
<b>Course type - Laboratory</b>		<b>Number of hours</b>
<b>C1</b>	Biopharmaceutics - a basic tool for modern pharmacotherapy - introduction	2
<b>C2- C11</b>	Case study based on bibliographic data: The first stage - the choice of disease for treatment, adjustment of drugs The second stage - the principle of action of applied drugs, the effects of treatment	6
<b>C12, C13</b>	Test and presentation from the first stage	6

<b>C14,</b> <b>C15</b>	Test and presentation from the second stage	6
<b>TOTAL:</b>		<b>15</b>

<b>DIDACTIC METHODS</b>		
1.	Lecture using audiovisual means and/or the PCz e-learning platform	
2.	Multimedia presentation	
3.	Original teaching materials	

<b>METHODS OF ASSESSMENTS: (F – FORMATIVE; S – SUMMATIVE)</b>		
<b>F01</b>	Assessment of activity on the	
<b>F02</b>	Assessment of problem-solving skills	
<b>S01</b>	Test	
<b>S02</b>	Participation in discussions and exercises	
<b>S03</b>	Colloquium	

<b>III. STUDENT WORKLOAD</b>		
<b>L.p.</b>	<b>Form of activity</b>	<b>Numer of hours for activity</b>
		<b>[hours]</b>
<b>1. Direct teaching hours:</b>		
<b>1.1</b>	Hours of classes organized by universities – lectures	30
<b>1.2</b>	Hours of classes organized by universities – exercises	15
<b>1.3</b>	Hours of classes organized by universities – laboratory	0
<b>1.4</b>	Hours of classes organized by universities – project	0
<b>1.5</b>	Hours of classes organized by universities – field activities	0
<b>1.6</b>	Hours of classes organized by universities – seminar	0
<b>1.7</b>	Exam	0
<b>Total direct hours:</b>		<b>45</b>
<b>2. Student's own work</b>		
<b>2.1</b>	Preparation for exercises and for final exams	15

2.2	Preparation for laboratory test reports, preparation of individual	0
2.3	Preparing your own project	0
2.4	Preparation for the final exam from the lecture	15
2.5	Exam Preparation	0
2.6	Reading the literature	0
<b>Total student's self-studies:</b>		<b>30</b>
<b>Overall student workload:</b>		<b>75</b>
<b>TOTAL NUMBER OF ECTS FOR THE COURSE:</b>		<b>3</b>
The number of ECTS credits that a student obtains in classes requiring the direct participation of the teacher:		<b>1,8</b>
The number of ECTS credits that the student obtains as part of his/her own work		<b>1,2</b>

<b>IV. PRIMARY AND SUPPLEMENTARY LITERATURE</b>	
<b>Primary literature</b>	
<b>1</b>	Biopharmaceutics & Pharmacokinetics, 2008. Biopharmaceutics & Pharmacokinetics. Pragati Books Pvt. Ltd.
<b>2</b>	Essentials Of Biopharmaceutics And Pharmacokinetics, 2010. Essentials Of Biopharmaceutics And Pharmacokinetics. Elsevier Health Sciences.
<b>3</b>	Biopharmaceutics Modeling and Simulations, 2012. Biopharmaceutics Modeling and Simulations. John Wiley & Sons.
<b>Supplementary literature</b>	

<b>V. LEARNING OUTCOMES ATTAINMENT MATRIX</b>							
Learning outcomes	In relation to the learning outcomes specified for the field of study	In relations to the learning outcomes to characteristic and second level PRK		Objectives subject	Content of programme	Teaching tools	evaluation methods
		universal	In technical sciences and leading to				

			<b>engineering competence</b>				
EU1	K_W04, K_W05	P7U_W	P7S_WG P7S_KK	C01	W1-15	1,2	P01
EU2	K_U02, K_U05	P7U_U	P7S_UK P7S_UO P7S_UW	C02	C1-15	2,3	F01, F02, S02, S03
EU3	K_K02, K_K05	P7U_K	P7S_KO, P7S_KR, P7S_KK	C03	C1-15	2,3	F01, F02, S02, S03

<b>VI. FORMS OF GRADES-DETAILS</b>	
<b>GRADES</b>	<b>EFFECTS OF LEARNING</b>
<b>EU1</b>	
<b>2,0</b>	He has no knowledge in the field about classification, occurrence of pharmaceuticals and their kinetics
<b>3,0</b>	He has only basic knowledge in the field about classification, occurrence of pharmaceuticals and their kinetics
<b>4,0</b>	Has basic knowledge of classification, occurrence of pharmaceuticals and their kinetics
<b>5,0</b>	Has extensive knowledge of classification, occurrence of pharmaceuticals and their kinetics
<b>EU2</b>	
<b>2,0</b>	Cannot describe the stages of biopharmaceuticals kinetics, especially their elimination by the liver and selected methods of application
<b>3,0</b>	He knows the stages of biopharmaceuticals kinetics, especially their elimination by the liver and selected methods of application
<b>4,0</b>	Can explain the stages of biopharmaceuticals kinetics, especially their elimination by the liver and selected methods of application

<b>5,0</b>	Can use research tools to explain biopharmaceuticals kinetics, especially their elimination by the liver and selected methods of application
<b>EU3</b>	
<b>2,0</b>	He is not ready to work in a team and is unable to work independently
<b>3,0</b>	He is ready to work individually, recognizes the need to work in a group.
<b>4,0</b>	He is ready to work individually and collaborate in a group.
<b>5,0</b>	The student can work individually and in a group. He is ready to cooperate in a group and he knows techniques of using biopharmaceuticals in human treatment, case study - basics of drug selection, principle of action and therapeutic effects
<p><b>A half mark of 3.5 is given if the student has fully passed the learning outcomes with a mark of 3.0 but has not fully assimilated the learning outcomes with a mark of 4.0 .</b></p> <p><b>A half mark of 4.5 is given in case of full credit of the LEARNING EFFECTS for a mark of 4.0 but the student has not fully assimilated the LEARNING EFFECTS for a mark of 5.0</b></p>	

<b>VII. OTHER USEFUL INFORMATION ABOUT THE SUBJECT</b>	
<b>1.</b>	Opportunity to review supporting materials and literature: <i>Appropriate to the type of material - in teaching classes, in the TUC Central Library.</i>
<b>2.</b>	Information on when and where the classes will be held <i>Notice board at the Faculty of Infrastructure and Environment and on the website of the Faculty of Infrastructure and Environment, MSz USOS system.</i>
<b>3.</b>	Information about the consultation (times + place): <i>the staff consultation schedule is available on the Faculty of Infrastructure and Environment website and on the staff room door.</i>