

## COURSE DESCRIPTION (SYLLABUS)

1.	Course:  <b>Metabolism of Lipids</b>
2.	Language of instruction:  <b>English</b>
3.	Faculty:  <b>Faculty of Biotechnology</b>
4.	Course/module code:  <b>29-BT-S1-E3...</b> (the code will be set soon)
5.	Course/module type ( <i>mandatory or elective</i> ):  <b>mandatory</b>
6.	Programme:  <b>Biotechnology</b>
7.	Study cycle ( <i>1st/2nd</i> ):  <b>1st cycle</b>
8.	Year:  <b>2<sup>nd</sup></b>
9.	Semester ( <i>autumn or spring</i> ):  <b>autumn</b>
10.	Form of tuition and number of hours: Laboratory: <b>30 h</b> Learning methods: <b>Students are provided with manuals before classes and are expected to read and understand tasks and experiments to be performed on a given day.</b> <b>Classes are preceded with introductions elucidating all possible difficulties students may meet.</b> <b>Students perform experiments individually, in pairs or as a group of 4-6. Obtained results are calculated and/or presented as a graph and discussed at the end of the classes.</b>
11.	Coordinator(s):  <b>Anna Jaromin, PhD</b>
12.	Initial requirements ( <i>knowledge, skills, social competences</i> ):  <b>Knowledge of the structure and function of macromolecules.</b>
13.	Objectives:  <b>Acquiring the ability to determine the enzymatic and non-enzymatic lipid peroxidation</b>

	<p>products and methods to prevent this process. Preservation of basic analytical techniques used in laboratory work, in particular with insoluble in aqueous solutions compounds. Exercises require students to independently conduct experiments together with the analysis of the obtained experimental results.</p>	
14.	<p>Content:</p> <p>Extraction of antioxidants from biological sources, analysis of extracts. Enzymatic peroxidation of lipids by lipoxygenases. Evaluation of the effects of concentration of lipoxygenase (in a absence and presence antioxidants) on lipids peroxidation. Non-enzymatic peroxidation of lipids. Evaluation of total antioxidant capacity of extracts containing antioxidants.</p>	
15.	<p>Learning outcomes:</p> <p><b>The student acquires the ability to use the basic terms and basic techniques used in biochemistry.</b></p> <p><b>The student acquires the ability to describe the obtained experimental results.</b></p> <p><b>The student acquires the ability to plan experiences using the methods learned.</b></p> <p><b>The student acquires the ability to work in a team and work in accordance with the principles of safety and hygiene.</b></p>	<p>Outcome symbols:</p> <p>K1_W06, K1_W08, K1_W10</p> <p>K1_U01, K1_U03, K1-U12</p> <p>K1_K02, K1_K03</p>
16.	<p>Recommended literature:</p> <p><b>Berg JM, Tymoczko JL, Stryer L, Biochemistry 6th ed. 2006</b></p> <p><b>Nelson DL, Cox MM, Lehninger Principles of Biochemistry 5th ed. 2008</b></p> <p><b>Garrett RH, Grisham CM, Biochemistry 4th ed. 2008</b></p> <p><b>Voet D, Voet JG, Biochemistry 4th ed. 2011</b></p> <p><b>Mathews CK, Van Holde KE, Appling DR, Anthony-Cahill SJ, Biochemistry 4th ed., 2013</b></p> <p><b>Niki E, Yoshida Y, Saito Y, Noguchi N Lipid peroxidation: Mechanisms, inhibition, and biological effects. Biochemical and Biophysical Research Communications 338 (2005) 668–676.</b></p> <p><b>Baysal T, Demirdoven A Lipoxygenase in fruits and vegetables: A review. Enzyme and Microbial Technology 40 (2007) 491–496.</b></p> <p><b>Litescu SC, Eremia S, Radu GL Methods for the determination of antioxidant capacity in food and raw materials. Advances in Experimental Medicine and Biology 698 (2010)241-249.</b></p>	
17.	<p>Methods of verification of the assumed learning outcomes:</p> <ul style="list-style-type: none"> <li>• <b>evaluation of the student’s work in the lab;</b></li> <li>• <b>written report describing the performed experiments and obtained results;</b></li> <li>• <b>written test.</b></li> </ul>	
18.	<p>Conditions of earning credits:</p> <ul style="list-style-type: none"> <li>• <b>active participation in laboratory classes;</b></li> </ul>	

	<ul style="list-style-type: none"> <li>• <b>proper preparation of written report on the experiments performed;</b></li> <li>• <b>final test result.</b></li> </ul>	
19.	Student's workload:	
	Activity	Number of hours for the activity
	Hours of instruction (as stipulated in study programme):	30 h
	<ul style="list-style-type: none"> <li>• laboratory classes and consultations</li> </ul>	
	Student's own work:	20 h
	<ul style="list-style-type: none"> <li>• reading the indicated literature: <b>5 h</b></li> <li>• preparation for written final test: <b>10 h</b></li> <li>• preparation of the report: <b>5 h</b></li> </ul>	
Total number of hours:		<b>50 h</b>
Number of ECTS:		<b>2 ECTS</b>