

Table 5.2 Course specification

Type and level of studies: Bachelor of Science Degree			
Course name: Monosaccharides and Bioactive Derivatives			
Course status: elective			
Number of ECTS credits: 6			
Requirement: none			
Course aim Nomenclature of Carbohydrates .Obtaining bioactive sugar molecules using methods of organic chemistry and chemo-enzymatic way. Introduce students to the biological mechanism of action of selected natural and synthetic derivatives of monosaccharides and oligosaccharides.			
Course outcome Master knowledge about types of modified carbohydrates. Synthesis and mechanism of action of the selected modified sugar and nucleoside analogues of biomedical interest. Mastering the nomenclature of natural monosaccharides and modified sugars.			
Course content			
<i>Theory</i> Ways of showing the structure of monosaccharides. Chemical and chemo-enzymatic synthesis of homonucleoside, C-glycosides, C-nucleosides, aza sugars, carba sugars, thio sugars and sugar mimics. The mechanism of action of selected biologically active derivatives of monosaccharides (glycosidases and glycosyltransferases inhibitors, antiviral agent, etc.). Nucleoside analogues with a modified base as drugs. Chemical glycobiology. Glycocode. Glycoproteins. Lectins. Carbohydrates in inflammation. Proteoglycan and selected their mimetic. Nomenclature of monosaccharides and derivatives of monosaccharides.			
<i>Practice: Practical classes, OFT, SRW</i> Multi-step synthesis of biologically active sugar derivatives.			
Literature			
1. Miljković, M. <i>Carbohydrates, Synthesis, Mechanisms, and Stereoelectronic Effects</i> , Springer Science+Business Media, LLC 2009.			
2. Stoddart, J. F. <i>Stereochemistry of Carbohydrates</i> , Wiley Interscience, New York, 1971.			
3. Kennedy, J. F. <i>Carbohydrate Chemistry</i> , Clarendon Press, Oxford, 1988.			
4. International Union of Pure and Applied Chemistry and International Union of Bio-chemistry and Molecular Biology, Joint Commission on Biochemical Nomenclature, McNaught, A. D. <i>Nomenclature of Carbohydrates</i> , Pure & Appl. Chem. 1996 , 68 (10), 1919.			
5. Nelson, D.L.; Cox, M. N. <i>Lehninger, Principles of Biochemistry</i> , Fifth Edition, W.H.Freeman and Company, 2008.			
6. Collins, P.; Ferrier, R. <i>Monosaccharides. Their Chemistry and Their Roles in Natural Products</i> , John Wiley & Sons, England, 1995.			
Number of classes of active teaching			Other classes
Lectures: 2 (30)	Practice:3 (45)	OFT: SRW:	
Teaching methods Lectures, laboratory work			
Assessment of knowledge (maximum of 100 points)			
Pre-exam obligations	Points	Final exam	points
activity during lecture classes	10	written exam	80
practical teaching	10	oral exam	