

Subject name	Analysis of Bioactive Components in Cereal Grain	
Subject code	T.KTW.ABCCG.AITZ.BX	
Department	Department of Carbohydrates Technology	
Faculty	Food Technology	
Subject supervisor/Lecturer	Krzysztof Buksa Ph.D	
General information	Semester:	winter semester
	ECTS credits	3
	Lectures total	15
	Laboratories	Lab practicals 15
Prerequisites (required knowledge or skills)	<p>Students should be familiar with basic knowledge of organic chemistry, laboratory working, measuring and working on a computer.</p> <p>Additionally, their ability to work with patience, collaboratively with peers and as an individual should be evident.</p>	
Objective and general description	<p>The aim of the course is to teach students about bioactive components in cereal grain and modern techniques of their analysis which are up-to-date and actually used in laboratories on the world.</p> <p>Techniques of isolation of interesting compounds from plant material, sample preparation and analysis will be shown with emphasis on chromatography.</p> <p>Students will gain special analytical abilities in examination of cereal components and impact of their properties on food and non-food industry.</p>	
Lectures 6x 2h + 1x 3h	<ol style="list-style-type: none"> 1. What are bioactive components in cereals? 2. Soluble and insoluble dietary fiber - is it healthy or not? Analysis of the composition of dietary fiber. An impact of dietary fiber on technological properties in food production. 3. How big are cereals polysaccharides? Methods of determination of molecular mass of cereal polysaccharides and practical application of the knowledge of polysaccharide molecular structure in food and non-food industry. 4. Cereal proteins – what is their role in cereal products? Methods of isolation of proteins and examination of their structure and properties. 5. Phenolic compounds as antioxidants having anti-cancer and anti-aging activity. 6. Substances affecting smell, taste and appearance of food products. 7. Future prospects for the analysis of bioactive components in plant material. Application of the knowledge concerning bioactive compounds in food industry, pharmacy, medical sciences and more. 	

<p>Classes 3x 5h</p>	<ol style="list-style-type: none"> 1. TLC and HPLC chromatography – modern, accurate, simple and fast methods for determination of sugar composition in cereal grains. 2. SEC chromatography as a tool for determination of molecular mass of starch, inulin, water soluble arabinoxylans and beta-glucans. 3. Isolation of proteins from rye and wheat grain. 4. Determination of selected phenolic acids in cereal and cereal products.
<p>Assessment method Specify: oral/written examination</p>	<p>Written examination</p>
<p>References</p>	<ol style="list-style-type: none"> 1. AOAC. Official methods of analysis. 18th edn. Gaithersburg Association of Official Analytical Chemists International (2006). 2. Chaplin M.F. Kennedy J.F. (1994). Carbohydrate Analysis. Oxford University Press 3. Cui S.W. (2005). Food carbohydrates: chemistry, physical properties and applications. 1st ed. CRC Press. 4. Eliasson A.C. (2006). Carbohydrates in food, 2nd edition. Taylor & Francis, New York. 5. Ito R., Matsuo Y. (2010). Handbook of carbohydrate polymers: development, properties and applications. Nova Science Pub Inc. 6. Kamerling J.P. (2007). Comprehensive Glycoscience. From Chemistry to Systems Biology. Elsevier Ltd. 7. Standard Methods of the ICC – International Association for Cereal Science and Technology. ICC – Vienna (2007).