

Level: bachelor				
Course title: Food Biochemistry (IB-406)				
Status: elective				
ECTS: 6				
Requirements: none				
Learning objectives To provide students with the systematic knowledge about biologically valuable and biologically active chemical constituents of food, their absorption, metabolic transformations, importance for organism, transformations during processing and storage. To provide the basic knowledge about food toxicology and experimental methods in food analysis. To introduce student to principles of rational diet, and trends in healthy food area.				
Learning outcomes After completing the course, student is able to (1) demonstrate knowledge of the main nutrient groups, their sources, absorption, metabolism and physiological role, (2) show understanding of effects of non-nutrients, contaminants, additives and changes during processing and storage on food safety and nutrition value, (3) demonstrate systematic knowledge of rational diet principles, specific needs and possible diet-related disorders of people of different age, health and habits, (4) independently conduct food quality and safety analysis and evaluate obtained results.				
Syllabus <i>Theoretical instruction</i> Nutrients in human diet. Macro- and micro-nutrients. Water-soluble and fat-soluble vitamins – function, absorption, deficiency. Minerals (macro- and trace elements) – sources, absorption, deficiency, toxicity. Dietary proteins, nutritive properties, digestion, physiological role, essential amino acids, dietary proteins as allergens. Dietary lipids, digestion, absorption, physiological role, essential fatty acids, effects of thermal processing, rancidity. Dietary carbohydrates, digestion, absorption, physiological role, dietary fibers. Food enzymes, fermentation. Chemical changes during food processing and storage. Secondary metabolites in food, antioxidants, phytoestrogens. Food energy, energy requirements. Energy metabolism, metabolism in starvation. Principles of rational diet – specific needs of people, balanced nutrition. Dietetic products, functional food, dietary supplements, pro- and prebiotics, organic food, genetically modified food. Nutrition of children and elderly, sick (kidney and heart diseases, diabetes), athletes. Vegetarianism. Malnutrition, obesity, nutrition-related diseases. Food additives (preservatives, sweeteners, flavours, colours, emulsifiers) – importance, role, safety. Food toxicology – contaminants (mycotoxins, antibiotics, hormones, heavy metals, pesticides, PCBs, PAHs), methods. Food quality and safety – legislative. <i>Practical instruction</i> Quality and composition analysis of selected foods: determination of moisture (gravimetric), fats (gravimetric by Soxhlet), rancidity – peroxide number (volumetric), proteins (spectrophotometric by Lowry), total sugars (by Bertrand), vitamin C (spectrophotometric), acidity (titrimetric), fatty acid composition (gas chromatographic), preservatives and sweeteners (liquid chromatographic).				
Weekly teaching load				Other:
Lectures: 2	Exercises: 3	Other forms of teaching:	Student research:	