

Course Unit Descriptor

Study Programme: Bachelor Academic Studies in Biochemistry
Course Unit Title: Biochemistry of Food and Nutrition
Course Unit Code: IB-406
Name of Lecturer(s): Associate professor Dejan Orčić
Type and Level of Studies: Bachelor of Science Degree
Course Status (compulsory/elective): elective
Semester (winter/summer): summer
Language of instruction: English
Mode of course unit delivery (face-to-face/distance learning): Face-to-face
Number of ECTS Allocated: 6
Prerequisites: none
<p>Course Aims:</p> <p>To provide students with the systematic knowledge about biologically valuable constituents of food, their absorption, metabolic transformations, importance for organism, effects of inadequate intake, and transformations during processing and storage. To introduce student to principles of rational diet, and trends in field of nutrition and food safety. To provide skills in application of standard experimental methods in food quality and safety testing.</p>
<p>Learning Outcomes:</p> <p>After completing the course, student is able to (1) demonstrate knowledge of the main nutrient groups, their sources, absorption, metabolism, physiological role, effects of insufficient and excessive intake, (2) show understanding of effects of non-nutrients, contaminants, additives and changes during processing and storage on food safety, sensory properties and nutrition value, (3) demonstrate systematic knowledge of rational nutrition principles, specific needs and possible diet-related disorders of people of different age, health and habits, (4) independently estimates nutritional status, energy and nutrient needs of a person, (5) independently conduct food quality and safety analysis and evaluate the obtained results.</p>
<p>Syllabus:</p> <p><i>Theory</i></p> <p>Nutrients in human diet. Dietary proteins, digestion and absorption, essential amino acids, biological value, functional properties of selected proteins. Dietary lipids, digestion and absorption, physiological role, essential fatty acids, rancidity. Dietary carbohydrates, digestion and absorption, dietary fibers. Minerals, water- and fat-soluble vitamins – sources, function, absorption, effects of insufficient and excessive intake. Chemical changes during food processing and storage, fermentation, spoilage. Food sensory properties. Food energy, energy requirements. Principles of rational nutrition – dietary guidelines for general population and specific groups. Trends – functional food, dietary supplements, probiotics and prebiotics, organic food, GMO. Malnutrition – obesity, undernourishment. Food toxicology – antropogenic and natural contaminants in food. Food additives – role, safety. Food quality and safety – legislation.</p> <p><i>Practice</i></p> <p>Quality and composition analysis of selected foods. Determination of fat (gravimetric method by Soxhlet) and moisture (gravimetric) in flour, noodles expansion during cooking, pH of cookies, proving soy flour in wheat flour. Determination of milk acidity (volumetric). Proving artificial colors in ground paprika. Proving starch in meat products, determination of nitrites in meat products. Determination of rancidity – peroxide number (volumetris). Determination of salt in pickles (volumetric). Determination of preservatives (HPLC) and vitamin C (spectrophotometric indophenol method) in</p>

beverages. Methanol determination in brandy (headspace GC-MS). Sensory evaluation of bread.

Required Reading:

1. Yildiz F (2010): Advances in food biochemistry, CRC Press, Taylor & Francis group, Boca Raton, USA.
2. deMan JM (1999): Principles of food chemistry, Aspen Publishers, Inc., Maryland, USA

Weekly Contact Hours: **Lectures:** 3 **Practical work:** 2

Teaching Methods: Lectures, laboratory work, consulting, e-learning (OER), seminar

Knowledge Assessment (maximum of 100 points): 100

Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	70
Practical work	10		
Seminar(s)	15		