

**86S1-AFZ**

**PHYSICOCHEMICAL ANALYSIS OF FOOD**

**ECTS: 3.0**

**HOURS PER SEMESTER/WEEK:** LECTURES: 15/1; CLASSES: 30/2

**FIELD OF THE STUDY:** Chemistry

**Level of study:** First-cycle (Bachelor's degree) program

**Course status:** optional \*

**Year of the study:** III

#### **COURSE CONTENTS**

**LECTURES:** Introduction to food chemistry and food composition. Collecting of food samples and extraction techniques used for food analysis. Types of classical methods applied for quantitative analysis of food. Physicochemical methods in food analysis (spectrophotometric, potentiometric). Identification of chemical compounds in food samples. Calculations used in analytical chemistry and the basics of statistics.

**CLASSES:** The student learns how to use the laboratory equipment and glassware for quantitative physicochemical analysis. Practical use of spectrophotometric and electroanalytical techniques. Elaboration of the final report on the analytical determination carried out. Quick analytical methods.

**EDUCATIONAL PURPOSE:** To ground knowledge of the analytical chemistry. To provide knowledge on the basics of the food chemistry and to make the students familiar with basic laboratory techniques used in quantitative and qualitative analyses of food composition. To develop the ability to select the appropriate analytical method to solve issues related to the analysis of food samples. To develop the ability to perform basic calculations related to analytical chemistry. To develop skills in independent laboratory work. To develop communication and teamwork skills.

#### **LEARNING OUTCOMES**

**Knowledge.** The student knows the systems for quality and safety control of food. He knows the basic chemical food contaminants. He understands the principles and the rules of instrumental analysis applied to the determination of food contaminants.

**Skills.** The student confidently uses classical methods of instrumental analytical chemistry. He can apply the principles of health and safety in the laboratory. The student selects appropriate conditions and appropriate analytical techniques depending on the analyzed compounds. He correctly interprets the results of the analytical measurements. He performs calculations in the basic level area (preparation of the solutions of the desired concentration, calculation of pH values) and calculations related to the estimation of results.

**Social competences.** The student evaluates objectively the contribution of one's own work and that of others in the joint research and report preparation. He applies the health and safety rules in a lab.

#### **TEACHING FORMS AND METHODS**

**Lectures.** Information lecture, Lecture with a multimedia presentation of selected issues.

**Classes.** Discussion, Case study, Laboratory methods, Demonstration and observation, Work in groups.

#### **FORM AND CONDITIONS FOR VERIFICATION OF LEARNING OUTCOMES**

**Lectures.** written test - credit with a grade.

**Classes.** written test - credit with grade.

#### **BASIC LITERATURE**

1) Skoog D.A., West D.M., Holler F.J., Crouch S.R. 2014. Fundamental of Analytical Chemistry. Ninth edition. Brooks/Cole, Cengage Learning

#### **ADDITIONAL LITERATURE**

1) Fifield F.W., Kealey D. 2000. Principles and Practice of Analytical Chemistry. Wyd. Wiley-Blackwell

#### **THE TEACHER/TEACHERS CONDUCTING THE CLASSES:**

dr hab. Danuta ZIELIŃSKA, prof. UWM [danuta.zielinska@uwm.edu.pl](mailto:danuta.zielinska@uwm.edu.pl)

Department of Chemistry, Plac Łódzki 4, 10-721 Olsztyn, POLAND