



Subject card

|   |  |  |          |                                     |  |            |     |
|---|--|--|----------|-------------------------------------|--|------------|-----|
| Subject name and code                       | Functional Properties of Food Ingredients, PG_00058619   |  |          |                                     |  |            |     |
| Field of study                              | Biotechnology  |  |          |                                     |  |            |     |
| Date of commencement of studies             | October 2023   | Academic year of realisation of subject  |          |                                     | 2023/2024  |            |     |
| Education level                             | second-cycle studies   | Subject group  |          |                                     | Optional subject group<br>Subject group related to scientific research in the field of study |            |     |
| Mode of study                               | Full-time studies  | Mode of delivery   |          |                                     | at the university  |            |     |
| Year of study                               | 1  | Language of instruction  |          |                                     | Polish   |            |     |
| Semester of study                           | 2  | ECTS credits   |          |                                     | 4.0  |            |     |
| Learning profile                            | general academic profile   | Assessment form  |          |                                     | assessment   |            |     |
| Conducting unit                             | Department of Chemistry, Technology and Biochemistry of Food -> Faculty of Chemistry   |  |          |                                     |  |            |     |
| Name and surname of lecturer (lecturers)    | Subject supervisor   | dr hab. inż. Hanna Staroszczyk   |          |                                     |  |            |     |
|   | Teachers   | dr hab. inż. Hanna Staroszczyk<br><br>dr inż. Szymon Mania<br><br>dr inż. Agata Sommer |          |                                     |  |            |     |
| Lesson types and methods of instruction     | Lesson type  | Lecture  | Tutorial | Laboratory                          | Project  | Seminar    | SUM |
|   | Number of study hours  | 15.0   | 0.0      | 45.0                                | 0.0  | 0.0        | 60  |
|   | E-learning hours included: 0.0   |  |          |                                     |  |            |     |
| Learning activity and number of study hours | Learning activity  | Participation in didactic classes included in study plan                               |          | Participation in consultation hours |  | Self-study | SUM |
|   | Number of study hours  | 60   |          | 8.0                                 |  | 32.0       | 100 |
| Subject objectives                          | To familiarize students with the knowledge of the impact of the interaction of major components on the properties and quality of foods and the role of these components in human nutrition, as well as of contamination and food safety. |  |          |                                     |  |            |     |

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| Learning outcomes  | Course outcome   | Subject outcome  | Method of verification  |
|  | [K7_U05] is able to apply instrumental methods of quantitative and qualitative analysis and studies on activity of biomolecules, select and apply diagnostic and analytical methods in the field of his/her specialty with particular emphasis on genetic, molecular and microbiological diagnostics and diagnostics based on antigen-antibody reaction  | The student isolates and identifies the basic food ingredients from raw materials of plant and animal origin.  | [SU4] Assessment of ability to use methods and tools<br>[SU3] Assessment of ability to use knowledge gained from the subject<br>[SU1] Assessment of task fulfilment |
|  | [K7_W07] knows issues related to plant and animal raw materials, their quality, impact on human health, processing technology and chemical and biological hazards resulting from process treatment and storage   | The student knows about the impact of nutrient interactions on the properties and quality of food products, as well as their effects on food safety.   | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge   |
|  | [K7_W02] has advanced knowledge of structure and activity of enzymes and biologically active compounds also in pharmacological context, knows basic instrumental methods of qualitative and quantitative analysis and activity studies of biomolecules   | The student knows about the influence of enzymes present in food raw materials on the properties and quality of the resulting products. He is able to determine them.  | [SW3] Assessment of knowledge contained in written work and projects<br>[SW1] Assessment of factual knowledge   |
| [K7_K02] is aware of the limitations and the necessity of continuous development of knowledge and technology; understands the need for education and constant training | The student is able to justify the importance of the development of science and technology for the development of food economy.  | [SK5] Assessment of ability to solve problems that arise in practice<br>[SK2] Assessment of progress of work   |   |
| Subject contents   | <p><b>Lecture.</b> Physical, biochemical and chemical interactions of proteins, polysaccharides, lipids and metal ions in terms of storage and processing of food and their effects on the properties and quality of the products. The role of nutrients in human nutrition. Contamination and food safety.</p> <p><b>Laboratory.</b> Caramelization of saccharides. Comparison of the lactose content in dairy products. The properties of gluten. Fractionation of muscle proteins. Proteolytic activity of muscle proteins. Functional properties of proteins. The influence of different technological factors on the ability of gelation of gelatine. Interaction of proteins and polysaccharides in aqueous solutions. Colorants. Study of the kinetics of the oxidation of fats. Analysis of compounds forming in fats during high temperature processing. Qualitative composition of phospholipids present in plant and animal products. Comparison of the composition of the fatty acids present in plant and animal phospholipids.</p> |  |   |
| Prerequisites and co-requisites  | Knowledge of organic chemistry, general knowledge of the composition and chemical and functional properties of food components.  |  |   |
| Assessment methods and criteria  | Subject passing criteria   | Passing threshold  | Percentage of the final grade   |
|  | midterm colloquium   | 60.0%  | 50.0%   |
|  | laboratory tests   | 60.0%  | 50.0%   |
| Recommended reading  | Basic literature   | <p>Red. Sikorski Z.E., Staroszczyk H. Chemia żywności. Tom 1. Główne składniki żywności; Tom 2. Biologiczne właściwości składników żywności. PWN. Warszawa 2017.</p> <p>Red. Gawęcki J. Żywnienie człowieka. Podstawy nauki o żywieniu. PWN. Warszawa 2012.</p> <p>Eds. Witczak A., Sikorski Z.E. Toxins and other harmful compounds in food. CRC Press. Boca Raton. London. New York. 2017.</p> <p>Eds. Sikorski Z.E. Chemical and functional properties of food components. CRC Press. Boca Raton FL 2002.</p> <p>Eds. Damodoran S., Parkin K.L. Fennema's Food Chemistry. CRC Press. Boca Raton. London. New York 2017.</p> |   |

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|  | Supplementary literature | <p>Eds. Witczak A., Sikorski Z.E. Toxins and other harmful compounds in food. CRC Press. Boca Raton. London. New York. 2017.</p> <p>Eds. Sikorski Z.E. Chemical and functional properties of food components. CRC Press. Boca Raton FL 2002.</p> <p>Eds. Damodoran S., Parkin K.L. Fennema's Food Chemistry. CRC Press. Boca Raton. London. New York 2017.</p>   |
| Example issues/<br>example questions/<br>tasks being completed | eResources addresses     | <p>Adresy na platformie eNauczenie:<br/>Funkcjonalne właściwości składników żywności 2023/2024 sem. letni - Moodle ID: 37718<br/><a href="https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37718">https://enauczanie.pg.edu.pl/moodle/course/view.php?id=37718</a></p> <p>Methods for assessing the quality and safety of health food.</p> <p>Chemical, physical and nutritional properties of lactose.</p> <p>Class karmeli and their application.</p> <p>The effect of hydration on its gelling properties gelatine way.</p> |
| Work placement   |                          | Not applicable   |