SZKOŁA GŁÓWNA GOSPODARSTWA WIEJSKIEGO

Technological design of food industry plants

Educational subject description sheet

Basic information

Field of study Food Science - Technology and Nutrition **Speciality** - **Organizational unit** Faculty of Food Technology **Study level** first cycle (bachelor's degree) **Study form** full-time studies **Education profile** General academic	**Didactic cycle** 2023/24 **Subject code** NoZTNS_D.120.02464.23 **Lecture languages** english **Mandatory** Elective subjects **Block** Major subjects **Disciplines** Food technology and nutrition

Coordinator	Hanna Kowalska
Teacher	Hanna Kowalska, Jolanta Kowalska, Agnieszka Ciurzyńska, Katarzyna Samborska

Period	**Examination**	**Number of ECTS points**
Semester 6	Pass with grade **Activities and hours** Lecture: 15 Project exercises: 45	4

Goals

Code	Goal
C1	The aim of the course is to teach students the principles of technological design of food industry plants. During the exercises, students design a technological line / food plant.

Entry requirements

General knowledge in the field of natural sciences, mathematics, computer science

Subject's learning outcomes

Code	Outcomes in terms of	Effects	Examination methods
Knowledge – Student knows and understands:			
W1	has consistent knowledge in the field of design and development of technological lines in the field of food processing	TN_K1_W04, TN_K1_W05, TN_K1_W06, TN_K1_W08	Written credit, Project
Skills – Student can:			
U1	make a simple technological project / technological line with the use of a computer programs supporting the design, eg AutoCAD	TN_K1_U04, TN_K1_U05, TN_K1_U08	Project, Assessment of activity during classes
Social competences – Student is ready to:			
K1	organizing work in a team and assuming various functions as well as planning and improving his own work and the work of team members	TN_K1_K01, TN_K1_K04	Project, Assessment of activity during classes

Study content

No.	Course content	Subject's learning outcomes	Activities
1.	Presentation of the scope of the subject and the rules of the settlement. Literature. Aspects and principles of designing food processing plants. Material balances. Recommended standards for the selected production profile and applicable documents for the design of plants and their use (laws, acts, regulations). Computer-aided design; examples of CAD applications and packages. TSelection and rules for the arrangement of machines and devices; land development concept. Food safety and quality (GMP, HACCP, etc.). Hygienic, sanitary and ecological aspects	W1	Lecture
2.	Teams of several people design a food industry plant / technological line based on the issues received from the teacher. Current design-related regulations are analyzed, e.g. construction, water and other regulations. Computer programs (computer stations), and databases of literature sources (internet resources, catalogs of company materials, etc.) are used. There are discussions about solving problems related to the selection of devices, drawing and developing technological lines, issues related to the plant's impact on the environment, etc.	W1, U1, K1	Project exercises

Course advanced

Activities	Methods of conducting classes

Activities	Methods of conducting classes
Lecture	Lecture, E-learning - lecture part
Project exercises	Discussion, Presentation, Design method, Teamwork

Activities	Examination method	Percentage
Lecture	Written credit	10%
Project exercises	Project	80%
Project exercises	Assessment of activity during classes	10%

Activities	Credit conditions
Lecture	written credit
Project exercises	written credit, project, discussion, activity during classes

Literature

Obligatory

1. Berk Z. (2009/2018). Food process engineering operations Ed. Taylor S. L. https://mastermilk.com/uploads/biblio/food_process_engineering_and_technology.pdf, https://books.google.pl/books?hl=pl&lr=&id=gj85DwAAQBAJ&oi=fnd&pg=PP1&dq=Food+Process++Engineering+and++Technology&ots=dY2jQwqrcO&sig=gg3Ks2LuvKl0HiU3BsIsnJwh_1E&redir_esc=y#v=onepage&q=Food%20Process%20%20Engineering%20and%20% 20Technology&f=false
2. Introduction to AutoCAD https://images-na.ssl-images-amazon.com/images/I/C1BxaOC0-IS.pdf
3. Maroulis, Z. B., & Saravacos, G. D. (2003). Food process design (Vol. 126). CRC Press. https://books.google.pl/books?hl=pl&lr=&id=OycSdO1F0_sC&oi=fnd&pg=PR5&dq=Food+Process+Design&ots=A986ZutmRf&sig=8Jg□rUy_ozLtJH8O9WLXB1Kin9w&redir_esc=y#v=onepage&q=Food%20Process%20Design&f=false

Optional

1. Mohan, C. O., Carvajal-Millan, E., Ravishankar, C. N., & Haghi, A. K. (Eds.). (2018). Food process engineering and quality assurance. CR
2. Saravacos, G. D., & Maroulis, Z. B. (2011). Food process engineering operations. CRC Press
3. Shafiur M., Ahmed A.J. (2012). Food Process Design: Overview.
4. Wanniarachchi, W. N. C., Gopura, R. A. R. C., & Punchihewa, H. K. G. (2016). Development of a layout model suitable for the food processing industry. Journal of Industrial Engineering, 2016. https://downloads.hindawi.com/archive/2016/2796806.pdf
5. Introduction to AutoCAD https://web.iit.edu/sites/web/files/departments/academic-affairs/academic-resource□center/pdfs/Introduction_to_AutoCAD.pdf

Calculation of ECTS points

Activity form	Activity hours*
Lecture	15
Project exercises	45
Self-study on the content covered in class	10

Preparing the project	20
Preparation of a multimedia presentation	10
Preparation for the exam	10
Preparation for exercises	10
Student workload	**Hours** 120
Number of ECTS points	**ECTS** 4

* hour means 45 minutes

Effects

Code	Content
TN_K1_K01	The graduate is ready to contact and exchange of experiences and knowledge with the experts in order to explore better solutions for particular problems connected to among others: food production, delivery chain, food storage and human nutrition
TN_K1_K04	The graduate is ready to responsible performing of professional roles, in it: compliance with the professional ethics and exploring knowledge related to the profession
TN_K1_U04	The graduate can analyze and evaluate the existing solutions appropriate for the food economy, identify problems and opportunities for professional activity, search for new solutions, and ways of their implementation using modern tools, including experiments, analytical methods, computer simulations, information and communication techniques, and others
TN_K1_U05	The graduate can carry out activities in the field of the technological and functional design of food production and mass catering plants, taking into account the marketing strategy and in accordance with the applicable standards of good manufacturing and hygienic practice as well as food quality and safety systems
TN_K1_U08	The graduate can plan, organize and carry out, independently or in a team, simple project tasks related to food production and evaluation, human nutrition, and consumer behaviour
TN_K1_W04	The graduate knows and understands the theoretical basis of phenomenon and changes occurring in raw materials, semi-finished products, and food products in a natural way, and under the influence of technological processes, food storage and testing
TN_K1_W05	The graduate knows and understands basics of construction and operation of machines, devices, and instruments used for food processing and testing
TN_K1_W06	The graduate knows and understands methods and techniques used for food processing, preservation, storage, and testing
TN_K1_W08	The graduate knows and understands rules and organization methods of the production and chain of food supply (planning, production organization, storage, distribution of food and food consumption in collective and individual nutrition) in accordance with the legal requirements of assurance of quality and food safety and the principles of sustainable development