Course name: TECHNOLOGICAL USEFULNESS OF PLANT RAW MATERIALS IN FOOD PRODUCTION

ECTS	3
Course status	*mandatory*
Course final assessment /evaluation of outcomes	*graded credit*
Prerequisite	*no*

Main field of study*: *Food Technology

Educational profile	academic
Code of studies and education level	bachelor
Semester of studies	winter
Language of instruction	English

Course offered by:

Name of faculty offering the course	Food Technology
Name of department offering the course	Carbohydrates Technology and Cereal Processing
Course coordinator	dr hab. inż. Stanisław Kowalski, prof. URK, dr hab. inż. Wiktor Berski, prof. URK

Learning outcomes:

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands			
TUS_WO1	the role of plants in nature, individual components of the plant cell, and biochemical processes occurring in plants also defines the systematic units of plants.	TŻ1_W01 TŻ1_W02	RT
TUS_W02	relationships between abiotic factors affecting plant production, describes the value of soils and characterizes some natural requirements of plants, and also characterizes plant raw materials in biological and agricultural terms.	TŻ1_W02 TŻ1_W03	RT
TUS_W03	sources and types of genetic and environmental variability, the phenomenon of allelopathy and heterosis, and the basis of transgenesis of plant organisms.	TŻ1_W01	RT
SKILLS – student can			
TUS_U01	distinguish a plant cell from an animal cell and assess the possibility of using plant organisms in food technology.	TŻ1_U04	RT
TUS_U02	use a microscope and prepare a microscope slide.	TŻ1_U07 TŻ1_U10	RT
TUS_U03	recognize the varieties of potatoes and beets, and the basic cereals grown in Poland, distinguish the types of ripeness of vegetables and fruits intended for specific directions of processing and identify and name oilseeds.	TŻ1_U04 TŻ1_U07	RT
TUS_U04	apply health and safety rules and good practices in the laboratory.	TŻ1_U06	RT
SOCIAL COMPETENCIES – student is ready to:			
TUS_K1	improvement of professional qualifications as well as personal development.	TŻ1_K01	RT
TUS_K2	demonstrate responsibility for their own and others' work in terms of safety.	TŻ1_K02	RT

Teaching contents

Lectures no	15 hours
Topics	The role of plants in nature and the human economy. Distribution of nutrients, technical ingredients, dyes, organic acids, and vitamins as well as alkaloids and glycosides in the cell; basic biochemical processes occurring in plants. Factors affecting photosynthesis. intensity and productivity Abiotic factors affecting plant production: climatic, topographic, and soil factors; elements of soil science, the evaluation of soils – classes, and complexes of agricultural suitability of soils. Some natural requirements of crop plants - the length of the vegetation period, development periods, plant development phases, critical periods, photoperiodism, extensive and intensive plants, the role and use of soil water by plants, and soil pH requirements. Sources and types of plant variability. Hereditary, environmental, and developmental variation. Influence of vegetative and generative propagation on plant variability. Systematic units of plants: variety, clone, population, species, chemical race; the phenomenon of heterosis and obtaining transgenic plants, the phenomenon of allelopathy, rotation, and crop rotation. Biological and agricultural characteristics of plant materials. Climate, soil, and agrotechnical requirements; the influence of harvest conditions and date on the quality of raw materials. Oil plants Biological and agricultural characteristics of plant materials. Climate, soil, and agrotechnical requirements; the influence of harvest conditions and date on the quality of raw materials. Cereal plants. Biological and agricultural characteristics of plant materials. Climate, soil, and agrotechnical requirements; the influence of harvest conditions and date on the quality of raw materials. Root crops. Biological and agricultural characteristics of plant materials. Climate, soil and agrotechnical requirements; the influence of harvest conditions and date on the quality of raw materials. Vegetables and fruits.
Accomplished learning outcomes	*TUS_W1; TUS_W2; TUS_W3; TUS_K1*
Means of verification, rules, and criteria of assessment	*written credit; for a positive assessment, at least 60% of correct answers to the questions should be provided. Participation in the final grade of the subject - 50%.*

Classes and seminars :	15 hours
Topics	Cell structure, functions of individual cell organelles. Structure and types of plant tissues. Morphological parts of plants, structure and their functions, root systems of cultivated plants, types of shoots, leaves and fruits. Vegetables and fruits - morphological features, types of ripeness of vegetables and fruits intended for specific directions of processing. Sugar beet - plant morphology, root anatomy, differences between sugar beet and fodder beet. Cereals - morphology of plants, common botanical features of cereals, morphological and anatomical structure of the kernel Potato - morphology of the plant, anatomical structure of the tuber, characteristics of potato varieties, division according to the way of use.
Accomplished learning outcomes	*TUS_U1; TUS_U2; TUS_U3; TUS_U4; TUS_K1; TUS_K2*
Means of verification, rules and criteria of assessment	*Passing exercises based on:* *- 2 partial tests in the field of exercises (positive grade for min. 51% of points) - share in the final grade 50%.*

References:

Basic	1. Botany Illustrated. Introduction to Plants Major Groups Flowering Plant Families. Janice Glimn-Lacy, Peter B. Kaufman (1984). https://link.springer.com/book/10.1007/978-94-009-5534-9 2. Plant Physiology, Development and Metabolism. Dr. Satish C Bhatla, Dr. Manju A. Lal (2018). https://link.springer.com/book/10.1007/978-981-13-2023-1

	3. Plant Anatomy. A Concept-Based Approach to the Structure of Seed Plants. Richard Crang, Sheila Lyons-Sobaski, Robert Wise (2018). https://link.springer.com/book/10.1007/978-3-319-77315-5 4. Materials provided to students by the teacher.
Supplementary	1. Encyclopedia of Agrophysics. Jan Gliński, Józef Horabik, Jerzy Lipiec in Encyclopedia of Earth Sciences Series (2011). https://link.springer.com/referencework/10.1007/978-90-481-3585-1 2. Crop Science Dr. Roxana Savin, Gustavo A. Slafer in Encyclopedia of Sustainability Science and Technology Series (2019. https://link.springer.com/referencework/10.1007/978-1-4939-8621-7

Structure of learning outcomes

Area of academic study: T – technological sciences	Depending on the discipline 3.0 ECTS**

Structure of student activity

Contact hours		32	hrs.	1.3	ECTS**
Including:	lectures	15	hrs.		
	classes and seminars	15	hrs.		
	consultations	1	hrs.		
	participation in research	0	hrs.		
	obligatory traineeships	0	hrs.		
	participation in examination	1	hrs.		
e-learning		….	hrs.	0.	ECTS**
student own work		43	hrs.	1.7	ECTS**

*Areas of academic study in the fields of: H- humanities; S - social studies; P – biological sciences; T – technological sciences; M- medical, sport and health sciences; R – Agricultural, forestry and veterinary sciences; A – the arts

** stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes