

**Załącznik nr 1****Course name:****Elective V: Raw materials and technologies in fruit and vegetables processing**

ECTS	3.0
Course status	<i>obligatory</i>
Course final assessment /evaluation of outcomes	<i>Written exam</i>
Prerequisite	<i>No prerequisites</i>

**Main field of study:****Food Technology and Human Nutrition**

Educational profile	General academic
Code of studies and education level	<i>SI/SM</i>
Semester of studies	6/summer
Language of instruction	English

**Course offered by:**

Name of faculty offering the course	Faculty of Food Technology
Name of department offering the course	Department of Plant Products Technology and Nutrition Hygiene
Course coordinator	dr hab. inż. Piotr Gębczyński, prof. URK

**Learning outcomes:**

Symbol of outcome	Description of the learning outcome	Reference to main field of study outcomes	Area symbol*
<b>KNOWLEDGE – student knows and understands</b>			
FB25_W1	basic principles of plant production, understands the relationship between the quality of fresh raw material and the quality of the final product, characterizes the types and sources of raw materials in fruit and vegetable processing, unit operations and technological processes used in the processing and preservation of fruit and vegetable food	TŻ1_W02	RT
FB25_W2	changes (physicochemical, microbiological, sensory) occurring in raw materials and fruit and vegetable products during processing and preservation; understands their relationship with the technological suitability of raw materials, nutritional value, quality and safety of finished products.	TŻ1_W03	RT
<b>SKILLS – student is able to</b>			
FB25_U1	develop a production process for a specific fruit and vegetable product, select raw materials for a given technological process, perform basic technological calculations and prepare a product recipe	TŻ1_U08 TŻ1_U09	RT

FB25_U2	conduct fundamental analyzes of the chemical composition and nutritional value of the raw material or fruit and vegetable product and assess its sensory characteristics; compare the obtained results with the requirements and interpret the differences	TW1_U07	RT
SOCIAL COMPETENCIES – student is ready to:			
FB24_K1	work in a team, taking on different roles in it, skilfully manages time,	TŽ1_K02	RT
FB24_K2	promoting the principles of rational nutrition following the current state of knowledge	TŽ1_K05	RT

### Teaching contents

Lectures		15 hours
Topics	Characteristics and requirements for raw materials used in fruit and vegetable processing.	
	General characteristics of fruit and vegetable preparation and preservation methods.	
	Pre-treatment of the raw material before the preservation process.	
	Frozen and canned fruit and vegetables.	
	Fermented and dehydrated products from fruits and vegetables.	
	Fruit and vegetable semi-finished products - pulp, puree, raw juice, concentrated juice.	
	Pulp- and puree-sweetened concentrates.	
Non-alcoholic fruit and vegetable drinks - fruit, vegetable and mixed juices, nectars, drinks).		
Accomplished learning outcomes		<i>FB25_W1; FB25_W2; FB25_K2</i>
Means of verification, rules and criteria of assessment		<i>Written exam: - for passing, the student must answer at least 51% of the questions correctly - participation in the subject's final grade - 60%.</i>
Classes:		15 hours
Topics	Fruit and vegetables suitable or not suitable for freezing, frozen products - types and assessment of selected ones.	
	Pasteurized and sterilized products in brine, recipe development and analysis of the selected product.	
	Fermented vegetables - raw materials, quality assessment of selected vegetable pickles.	
	Dried fruits and vegetables - types of products, their evaluation.	
	Sweetened fruit products - jams, marmalades, plum preserve: assessment of selected parameters, common and distinguishing features	
Characteristics of semi-finished products used in soft drinks (juices, nectars, drinks).		
Receipt of selected product development, its preparation and quality assessment.		
Accomplished learning outcomes		<i>FB25_U1; FB25_U2; FB25_K1; FB25_K2</i>
Means of verification, rules and criteria of assessment		<i>Pass of the classes based on: - individual reports on laboratory work (average of the obtained grades) - participation in the final grade 20%, - 2 partial tests (positive grade for at least 51% of points) - participation in the final grade 20%.</i>

### References:

Basic	<ol style="list-style-type: none"> <li>Hui Y.E. (ed.) <i>Handbook of fruits and fruit processing</i>. Blackwell Publ. 2006 (available from the course coordinator)</li> <li>Saravacos G.D., Kastropoulos A.E. 2002. <i>Handbook of food processing equipment</i>. Springer Science+Business Media, LLC (available at Springer Link in the University net)</li> </ol>
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Supplementary	<p>1. Shakaya R., Lal M.A. 2018. <i>Fruit development and ripening</i>. In: Bhatla S.C., Lal M.A. (eds.) <i>Plant physiology, developmnt and metabolism</i>. Springer nature. Singapore. (available at Springer Link in the University net)</p> <p>2. Lim T.K. 2012. <i>Edible Medicinal and Non-Medicinal Plants</i>. Vol. 1, Fruits. Springer. Dodrecht, New York. (available at Springer Link in the University net)</p>
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### Structure of learning outcomes

Area of academic study: R – Agricultural, forestry and veterinary sciences	ECTS
Area of academic study: T – technological sciences	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	0	hrs.	0.0	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