Course name: Plant-based dietary supplements

ECTS	*5*
Course status	*facultative*
Course final assessment /evaluation of outcomes	*exam*
Prerequisite	*knowledge of plant biology and the basics of biochemistry at the level of undergraduate or engineering agricultural / natural studies*

Main field of study:
Agriculture and Horticulture, Biology and Biotechnology (Erasmus+)

Educational profile	*general academic*
Code of studies and education level	*bachelor/engineer (SI) or master of science (SM)*
Semester of studies	*winter or summer*
Language of instruction	*English*

Course offered by:

Name of faculty offering the course	Faculty of Biotechnology and Horticulture
Name of department offering the course	Department of Horticulture
Course coordinator	dr inż. Barbara Domagała

Learning outcomes:

Symbol of outcome	*Description of the learning outcome*	Reference to main field of study outcomes	Area symbol*
KNOWLEDGE – student knows and understands:			
PDS_W1	composition of dietary supplements, with particular emphasis on plant raw materials used in their production	TRL2_W01 TRL2_W04	R, P
PDS_W2	effect of using these plant-based supplements on the human organism and the mechanisms of their action/reaction	TRL2_W01 TRL2_W04	R, P
PDS_W3	list the species of horticultural plants used in in the pharmaceutical and dietary supplement production program and the active substances obtained from them	TRL2_W01 TRL2_W04	R, P
PDS_W4	basic legal regulations regarding the marketing of dietary supplements and the basics of the law relating to the cosmetics market in the European Union	TRL2_W01 TRL2_W04	R, P
PDS_W5	effects of plant-based dietary supplements on the human body	TRL2_W01 TRL2_W04	R, P
PDS_W6	basics principles of a balanced diet	TRL2_W01 TRL2_W04	R, P
SKILLS – student is able to:			
PDS_U1	modifies the methods of composing a balanced diet	TRL2_U01 TRL2_U05	R, P
PDS_U2	develops agrotechnics for the cultivation of more important species in order to use the product as a dietary supplement	TRL2_U01 TRL2_U05	R, P
PDS_U3	prepare selected dietary supplements of plant origin	TRL2_U01 TRL2_U05	R, P
PDS_U4	determines the suitability of a given plant ingredient for the production of a dietary supplements	TRL2_U01 TRL2_U05	R, P
SOCIAL COMPETENCIES – student is ready to:			
PDS_K1	define priorities for the proper selection and preparation of plant materials for use in dietary supplements	TRL2_K02	R, P
PDS_K2	assess the risk to the human body caused by improper use of plant dietary supplements	TRL2_K04 TRL2_K05	R, P
PDS_K3	choose the most appropriate dietary supplements in terms of their composition	TRL2_K03	R, P

Teaching contents

Lectures		30 hours
Topics	History of dietary supplementary production The mechanisms of action of supplements and other medical products Differences between cosmeceuticals and drugs and dietary supplements Supplements in sports Supplements in diseases of the skin Supplements in the system digestive and nervous Supplements in the problem of obesity Supplements that affect the body's immunity Fundamentals of the law relating to the production, marketing and sale of diet supplements in the European Union Development of instructions on the choice of species, preparation methods and application of the preparation	
Accomplished learning outcomes		*PDS_W1, PDS_W2, PDS_W3,PDS_W4, PDS_W5, PDS_W6*
Means of verification, rules and criteria of assessment		*evaluation is based on test questions, in order to earn a positive mark at least 51% of answers must be correct. Contribution to the final grade from the course – 65%*
Classes		30 hours
Topics	A visit to a company that produces dietary supplements based on plant products Production of diet supplements Presentation of the production method, application and effectiveness of the diet supplements produced by them Botanical sources of nutritional supplements: exploring diversity and benefits Quality control and standardization of plant-based dietary supplements Pharmacological properties and mechanisms of action of herbal supplements Regulatory framework and safety considerations in plant-based dietary supplement industry	
Accomplished learning outcomes		*PDS_U1, PDS_U2, PDS_U3, PDS_U4, PDS_K1, PDS_K2, PDS_K3*
Means of verification, rules and criteria of assessment		*evaluation is based on: - individual reports from laboratory activities, contribution to the final grade from the course – 15%; - two tests from the laboratory topics (at least 51% of correct answers to earn a positive mark), contribution to the final grade from the course – 20%*

References:

Basic	*Balch, P. A. (2006). Prescription for nutritional healing. Penguin* *Greenwood, M., Cooke, M. B., Ziegenfuss, T., Kalman, D. S., & Antonio, J. (Eds.). (2015). Nutritional supplements in sports and exercise. Humana Press*
Supplementary	*Hennekens C.H., et al., Lack of effect of long-term supplementation with beta carotene on the incidence of malignant neoplasms and cardiovascular disease, New England Journal of Medicine, 334.18 (1996): 1145-114* *Maret W., Sandstead H.H., Zinc requirements and the risks and benefits of zinc supplementation, Journal of Trace Elements in Medicine and Biology, 20.1 (2006): 3-18* *Poortmans J.R., Francaux M., Adverse effects of creatine supplementation, Sports Medicine, 30.3 (2000): 155-170* *Vanhatalo A., et al., Acute and chronic effects of dietary nitrate supplementation on blood pressure and the physiological responses to moderate-intensity and incremental exercise, American Journal of Physiology-Regulatory, Integrative and Comparative Physiology, 299.4 (2010): R1121-R1131*

Structure of learning outcomes

Area of academic study: agriculture and horticulture	3.0 ECTS**
Area of academic study: biological sciences	2.0 ECTS**

Structure of student activity

Contact hours		68	hrs.	3.0	ECTS**
Including:	lectures	30	hrs.		
	classes and seminars	30	hrs.		
	consultations	4	hrs.		
	participation in research	…	hrs.		
	obligatory traineeships	…	hrs.		
	participation in examination	4	hrs.		
e-learning		…	hrs.	…	ECTS**
student own work		62	hrs.	2.0	ECTS**

*areas of academic study in the fields of: P – biological sciences; R – agriculture and horticulture

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