

Course name:

SUSTAINABLE CROP PRODUCTION

ECTS	11
Course status	complementary
Course final assesement/evaluation of outcomes	exam
Prerequisites	Prerequisites Knowledge and skills in the scope of biology, plant physiology, meteorology and principle of mathematics and statistics

Main field of study:

field of study name (capital letters)

Profile of study	General-academic
The code of studies (education level)	SI/SM (bachelor/master)
Semester of studies	winter/summer
Language of instruction	English

Course offered by:

Name of faculty offering the course	Faculty of Agriculture and Economics
Name of department offering the course	Department of Agroecology and Plant Production
Course coordinator	Agnieszka Klimek-Kopyra

Learning outcomes of the course:

Symbol of outcome	Description of learning outcome	Reference to	
		main field of study outcomes	discipline#
KNOWLEDGE – student knows and/or understands:			
PPP_W1	Student knows anatomical and morphological structure of agricultural plants	RO1_W01	RR
PPP_W2	Student knows basic issues concerning the structure and functioning of the basic life processes of plants, regulation mechanisms and interaction: plant - environment.	RO1_W10	RR
PPP_W3	Student knows chemical composition of usable agricultural plant organs and their functional value	RO1_W10	RR
PPP_W4	Student knows the basic principles, methods, technologies to use the potential nature in plant production with high-quality raw materials	RO1_W13	RR
SKILLS – student is able to:			
PPP_U1	Student recognizes plant species and their seeds	RO1_U07	RR
PPP_U2	Student can estimate the effect of agrtechnical factors on growth, development and yielding of agricultural plants	RO1_U12	RR
PPP_U3	Student is able to calculate the fertilization needs of arable plants	RO1_U16	RR
PPP_U4	Student is able to design and evaluate plant production systems and technologies	RO1_U21	RR
SOCIAL COMPETENCE- student is ready to:			
PPP_K1	Student perceives a necessity or on-going upgrading a knowledge in the field of modern technologies of crop production	RO1_K01	RR

PPP_K2	Student perceives a necessity to gather and interpret relevant data	RO1_K03	RR
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Teaching contents:

Lectures	40	hours
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Topics of the lectures	<p>Sustainable agriculture; impact on food production and food security</p> <p>Analysis of the effect and future impact of current agricultural practices on the environment</p> <p>Evaluation of sustainable crop production and new technologies to improve sustainability; recommended methods of soil management</p> <p>Recommended methods and requirements for sustainable crop production</p> <p>Sustainable low-input cereal production; agrotechnology of crop production; methods of culture, ploughing and preparing the land, testing the seed, time, depth and rate planting, soil cultivation, harvesting and storing, variety, crop</p> <p>Sustainable low-input perennial and annual grasses production- agrotechnology of crop production</p> <p>Sustainable low-input legumes for grain production - agrotechnology of crop production</p> <p>Sustainable low-input legumes for forage production - agrotechnology of crop production</p> <p>Sustainable low-input root crop production – agrotechnology of crop production</p> <p>Sustainable low-input of tuber crop production –agrotechnology of crop production</p> <p>Sustainable low-input oilseed crop production; agrotechnology of crop production</p> <p>Sustainable low-input fiber crop production; agrotechnology of crop production</p> <p>Sustainable crop rotations with cover crop</p>
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Accomplished learning outcomes	RO1_W01; RO1_W10; RO1_W13;
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Verification methods, rules and criteria of outcome assessment	<i>Methods and criteria of grading: written test exam (about 45 questions from the entire range of the subject with four response options), 0 or 1 pt. for each question</i>
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Classes	55	hours
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Topics of the classes	<p>Introductory view; Classification of plants, length of life, cultivated plants, field crop, classification of field crop, definition of terms, rotation experiments</p> <p>Cereals (wheat, oats, barley, rye, maize); historical and botanical characteristics, morphology, root, stem, uses, production, adaptation</p> <p>Project : agrotechnical methods of cereal production</p> <p>The perennial and annual grasses (timothy, ryegrasses, bromum grasses, millet, sorghum); Introductory, botanical and morphological description, distribution and adaptation, uses, cultural methods</p> <p>Legumes in general; description, morphology, relation to soil fertility, bacteria in relation to legume, inoculation</p> <p>Legumes for grain and forage (Field pea, Field bean, Soybean, Cicer, Vetch, Lupine); botanical and morphological description, distribution and adaptation, uses and cultural methods</p> <p>Project ; agrotechnical methods of legume crop production</p> <p>Legume for forage (Clover, Alfalfa); botanical and morphological description, distribution and adaptation, uses and cultural methods</p> <p>Root /tube crop (Sugar beet, Turnips, Carrot, Rape, Chicory, Potato); Introductory, botanical and morphological description, distribution and adaptation, uses, cultural methods</p> <p>Project: agrotechnical methods of root crop production</p>
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The oilseed crop (Rape, Sunflower, Papaver, Linseed, Sinapis) Introductory, botanical and morphological description, distribution and adaptation, uses, cultural methods

Project: agrotechnical methods of oilseed crop production

The fiber crop (Cotton, Flax, Hemp); Introductory, botanical and morphological description, distribution and adaptation, uses, cultural methods

Project: agrotechnical methods of fibre crop production

General discussion about project outcomes and common shortcomings

Accomplished learning outcomes	RO1_U07; RO1_U12;RO1_U16;RO1_U21
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Verification methods, rules and criteria of outcome assessment	<p>Classes: written 2 colloquia, 2 projects</p> <p>Methods and criteria of grading:</p> <p>Classes:</p> <p>a / evaluation of the quality of laboratory work (included analytical skills, correctness and accuracy of measurement, collaboration with other students), each classes rated as 0 or 1</p> <p>b / evaluation of laboratory reports including quality of data analysis, and interpretation), each report rated as 0 to 4</p> <p>Overall rating: (a + b) for each classes/number of classes</p>
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Seminars/Field trip **10** **hours**

Topics of the seminars	<p>Recognition of crop plants in different stages in the field conditions, BBCH scales</p> <p>Remote sensing techniques for plant analysis. Greenseeker NDVI technology to monitor nitrogen status</p> <p>Estimation of crop nutritional status using Smart Apps to support nitrogen fertilization</p>
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Accomplished learning outcomes	RO1_U07; RO1_U12;RO1_U16;RO1_U21
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Verification methods, rules and criteria of outcome assessment	Obligatory presence on field trip is required.
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References:

Basic	<p>Acquaah G. <i>Principles of crop production: theory, techniques, and technology</i>. 2002</p> <p>Eric Lichtfouse, Mireille Navarrete. <i>Sustainable Agriculture - Tom 1</i>, 2009</p> <p>Eric Lichtfouse, Marjolaine Hamelin, Mireille Navarrete, Philippe Debaeke. <i>Sustainable Agriculture, Tom 2</i>. 2011</p>
Supplementary	<p>Gliessman, S.R. 2007. <i>Agroecology: The Ecology of Sustainable Food Systems</i>. CRC Press LLC, Boca Raton, FL.</p> <p>Nestle, M. 2002. <i>Food Politics: How the Food Industry Influences Nutrition and Health</i>. University of CA Press, Ltd., London.</p> <p>Powers, L. E. and R. McSorley. 2000. <i>Ecological principles of agriculture</i>. Delmar Thomson Learning,</p>

Structure of learning outcomes:

Discipline: # RR	11	ECTS**
Discipline: # (provide appropriate symbol - if the course relates to more than one academic discipline)	...	ECTS**

Structure of student activities:

Contact hours	117	hours	4,7	ECTS**
including:				
lectures	40	hours		
classes and seminars	65	hours		
consultations	10	hours		
participation in research	...	hours		

mandatory traineeships	...	hours		
participation in examinations	2	hours		
e-learning	...	hours	...	ECTS**
student own work	158	hours	6,3	ECTS**

Syllabus valid from the academic year 2021/2022

* **where 10 hours of classes = 1 ECTC (in case of 15 h → 2 ECTS)**

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

academic discipline code: RR - agriculture and horticulture