

Course name:	Sustainable horticulture	ECTS	7
Translation of the course name into English:	-		
Study field:	General Horticulture		

Language of lectures:	English	Study level: Master of science	
Study form: <input checked="" type="checkbox"/> stationary <input type="checkbox"/> extramural	Status of lectures: <input type="checkbox"/> primary <input checked="" type="checkbox"/> obligatory <input checked="" type="checkbox"/> directional <input type="checkbox"/> facultative	Semester number: 1	<input type="checkbox"/> winter semester <input checked="" type="checkbox"/> spring semester
Academic year from which the description applies		2021/2022	Catalog number: OGR-O2-S-1L05 ang

Course coordinator:	Prof. Andrzej Pacholczak
Lecturers:	Prof. Andrzej Pacholczak, dr Dariusz Sochacki
Unit running the course:	Department of Ornamental Plants
Unit ordering the course:	Faculty of Horticulture

Assumptions, objectives and description of the course:	<p>In the frame of lecture program of pomology, ornamentals, vegetable and medicinal plants the students will be acquainted with bases of integrated and ecological plant production, its certification, factors affecting product quality, its durability in storage and methods of product preparation for market turnover. Student will know the plant ingredients of biological activity and methods of its determination. As for ornamental plants the student will get acquainted with possibilities to use integrated production and registration of pesticides used in horticultural enterprises. Modern forms of application of ornamentals resistant to urban conditions will be presented. As for plant protection student will learn about environmental threats resulting from lack of rational and sustainable protection against pests.</p> <p>Students will also get acquainted with integrated and ecological plant production methods of different vegetables, based on GAP and EUREPGAP concepts, methods of their storage and turnover, quality of ecologically produced vegetables, proecological methods of harvesting herbs from natural habitats, preservation of herb products allowing to keep their use value and bases of turnover of herb products.</p> <p>As for ornamentals students will learn about application of integrated plant protection in horticultural enterprises and ornamental nurseries, registration of pesticides, water- and energy saving methods of plant production under covers. Modern forms of application of ornamentals resistant to urban conditions will be presented, and their effect on humans and environment shown. As for pomology, students will get acquainted with the integrated method of fruit production, ecological production in EU and Poland, and especially with localization of production site and the right choice of planting material for different fruit plants as well as with requirements and restrictions in application of pesticides in ecological orchards. In the part concerning plant protection the alternative methods of pest control will be presented, with a special consideration of biological pest control. Problems of invasive organisms will be presented as well as risk analysis of introduction into environment of alien species.</p> <p>During practical classes in vegetable plant production students carry on the experiments with hydroponics of leafy vegetables grown in different culture media. They evaluate parameters of the culture, yields and plant quality, determine contents of components decisive for plant value – nutritional, biological and sensory (qualitative and quantitative methods). They evaluate commercial value of vegetables and herbs - based on the European Economic Commission and ISO – coming from different culture conditions and provided with different nitrogen compounds and other fertilizers. Practical classes include as well technology of the integrated vegetable production of the selected species.</p> <p>As for ornamentals students analyze and prepare landscaping proposition for a selected urban area, taking into consideration the existing infrastructure and a choice of plants resistant to urban conditions and pests and diseases as the use of pesticides in towns is limited (case study, work in groups). Practical classes include methods of production of bedding plants with the limited water and pesticide use.</p> <p>As for pomology students get acquainted with an ecological orchard managed according to IPO methodology. They make their own observations, notes and perform certain treatments in the orchard. As for plant protection students get acquainted with the methods alternative to the chemical pest control. They visit an ornamental nursery where integrated plant protection is being carried out, an ecological orchard and an enterprise producing vegetable planting material with the use of IPP.</p>
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Didactic forms, number of hours:	Lectures: hours 45 Practical classes: hours 45
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Teaching methods:	Lectures, multimedia presentations, demonstrations, laboratory and practical exercises, discussion, problem solving
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Formal requirements and prerequisites:	Vegetable, Horticulture, Ornamental plants, Plant Protection - Phytopathology, Plant Protection - Entomology, Botany, Soil Science, Dendrology
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Learning outcomes:	<p>Knowledge: W_01 - know bases of integrated and ecological plant production W_02 - knows basic methods of horticultural plant production W_03 - knows and understands phenomena and processes occurring in plants during growth and after harvest</p>	<p>Skills: U_01 - is able to choose methods of plant protection used in ecological production U_02 - is able to present ecological production of vegetables and fruits U_03 - is able to choose ornamental plants useful in urban greenery, which do not need pesticides during vegetation U_04 - is able to work in group and to show creativity in applying science in practice</p>	<p>Competences: K_01 - is aware of meaning of modern methods of integrated production of vegetables and fruits K_02 - is aware of necessity to behave according to the principles of ethics K_03 - is able to solve problems associated with the technology of integrated and ecological production</p>
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The way of verification of learning outcomes :	Efect W_02, W_03, U_02, U_03, K_03 - tests during classes Efect W_01, W_03, U_01, U_02, U_03, U_04, K_03 - project task Efect W_03, U_01, U_02, U_03, U_04, K_01, K_02, K_03 - evaluation of experiments performed during the course Efect W_01, W_02, W_03, U_01, U_02, U_03 - exam
Form of documentation of achieved learning outcomes :	Name student evaluation card, content of assessment questions with grade
Elements and weights affecting the final grade:	Tests during classes - 30% Assessment of the implementation of the project task - 20% Exam - 50%
Place of classes:	Classroom, laboratories, experimental orchard, nursery, gardening farm
Basic and supplementary literature :	
<ol style="list-style-type: none"> 1. Gajewski M. 2005. Przechowalnictwo warzyw. Wyd. SGGW, Warszawa. 2. Praca zbiorowa pod red. M. Knafliewskiego. 2008. Ogólna uprawa warzyw. PWRiL Poznań. 3. Latkowska M.J. 2011. „Zielona” natura człowieka. W: Ogród za oknem-W zgodzie z naturą, Wyd. Sztuka Ogródu-Sztuka Krajobrazu: 94-102. 4. Nowak J. 2005. Wpływ roślin ozdobnych na zdrowie człowieka. Zesz. Prob. Post. Nauk Rol. 504: 33-42. 5. Marosz A., Sekrecka D., Soika G., Wojdyła A. 2016. Metodyka integrowanej ochrony ozdobnych drzew alejowych z rodziny różowatych. IO, Skierniewice. 6. Marosz A., Sekrecka D., Soika G., Wojdyła A. 2016. Metodyka integrowanej ochrony świerka na choinki. IO, Skierniewice. 7. Pruszyński S., Bartkowski J., Pruszyński G. 2012. Integrowana ochrona roślin w zarysie. Centrum Doradztw Rolniczego w Brwinowie oddział w Poznaniu. 8. Pieniążek S.A. 2000. Sadownictwo. PWRiL, Warszawa. 9. Program ochrony roślin sadowniczych 2018. Hortpress, Warszawa. 10. Uprawa drzew ziarnkowych oraz orzecha włoskiego i leszczyny metodami ekologicznymi: http://www.odr.net.pl/publikacje/0119.pdf. 11. Weibel F.P., Tamm L., Wyss E., Daniel C., Häseli A, Suter F. 2007. Organic fruit production in Europe: successes in production and marketing in the last decade, perspectives and challenges for the future development. Acta Hort. 737: 163-172. 8. Willer H. Yussefi M. 2006. The world of organic agriculture. Statistics & emerging trends. 12. Katalog roślin, drzewa, krzewy, byliny polecane przez ZSzP 2016. Agencja Promocji Zieleni, Warszawa. 	
COMMENTS	

Quantitative indicators characterizing the module / object:

Estimated total number of student work hours (contact and own work) necessary to achieve the assumed learning outcomes - on this basis, complete the ECTS field:	187 h
The total number of ECTS points that a student receives in classes requiring direct participation of academic teachers or other lecturers:	4 ECTS

Table of compliance of the directional learning outcomes with the effects of the course:

Effect category	Learning outcomes for the course:	Reference to learning outcomes specific for study program on particular study field (direction)	The impact of course on the directional effect *)
Knowledge - W_01	know bases of integrated and ecological plant production	K_W01; K_W02	3; 2
Knowledge - W_02	knows basic methods of horticultural plant production	K_W04; K_W09	2; 2
Knowledge - W_03	knows and understands phenomena and processes occurring in plants during growth and after harvest	K_W01; K_W02; K_W04; K_W06	3; 2; 3; 2
Skills - U_01	is able to choose methods of plant protection used in ecological production	K_U01; K_U04	2; 2
Skills - U_02	is able to present ecological production of vegetables and fruits	K_U01; K_U06; K_U08	2; 2; 1
Skills - U_03	is able to choose ornamental plants useful in urban greenery, which do not need pesticides during vegetation	K_U01; K_U04; K_U08	1; 1; 1
Skills - U_04	is able to work in group and to show creativity in applying science in practice	K_U11	1
Competences - K_01	is aware of meaning of modern methods of integrated production of vegetables and fruits	K_K01	1
Competences - K_02	is aware of necessity to behave according to the principles of ethics	K_K04	1
Competences - K_03	is able to solve problems associated with the technology of integrated and ecological production	K_K05	2