

Course Unit Descriptor

Study Programme: Soil, plant and genetics			
Course Unit Title: Vegetable Production in Greenhouses			
Course Unit Code: 19.ZB4002			
Name of Lecturer(s): Žarko Ilin			
Type and Level of Studies: Master academic studies			
Course Status (compulsory/elective): Compulsory			
Semester (winter/summer): Winter			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): Face-to-face/distance learning			
Number of ECTS Allocated: 6			
Prerequisites: None			
<p>Course Aims: The aim of the course is to train and teach students for using new technologies in growing of vegetables in greenhouses. This refers to the systems of vegetable growing in the land and in the system of vegetable growing "landless" in the organic and inorganic substrates. Students will be trained to feed plants in Nutrient Film Technique (NFT), drip irrigation, puncture emitters and spraying based on the sum of the radiation (J / cm^2). The goal is to teach students to be familiar with computer controlled microclimate conditions, proper nutrition and biological protection of vegetables in different forms and types of greenhouses.</p>			
<p>Learning Outcomes: The outcome of this course is training of specialist, to be able to implement and with this knowledge to manage with new techniques and technologies of vegetable productions in greenhouses.</p> <p>Skills: Students will gain knowledge in the management of microclimate conditions and methods of plant feeding with complex and individual liquid and solid fertilizers. Students will be trained for designing and planning of vegetable production (changing 2-3 crops in a year or specialization of production one crop in the full-year cycle), control and education of direct perpetrators job.</p>			
<p>Syllabus:</p> <p>Theory: Students will be introduced with a brief history of growing vegetables in greenhouses. Students will be introduced to the biological, ecological, agro-technical and economic importance of vegetable production in greenhouses. Also it will be lecture about the importance of the choice of location, ground leveling, about construction and types of green houses. It is important to know the properties of cover (glass, foil, polycarbonates), energy curtains, shading material. Students will be informed with systems for ventilation, heating, fertigation (NFT, drip irrigation, sprinkling, stab emitters), sensors for the control of microclimate conditions and computer equipment. Students will be qualified to plan and organize the greenhouses, the structure of sowing or planting. They will learn about different production technologies on a flat surface, concrete base, tables, gutters and to the organic (coconut fiber mixtures of black and white peat) and inorganic substrates (rockwool, perlite). In a special section will be put emphasis on the production of seedlings for production in greenhouses. Students will master the technologies of production less required species (lettuce, spinach, chard, cabbages, radish, leafy parsley, chives, etc.) according to growing conditions (temperature, light, relative humidity). The emphasis is on technologies of growing termophilic vegetable species from the family Solanaceae (pepper, tomatoe, egg plant), Cucurbitaceae (cucumber, melon, watermelon, zucchini). We will point the importance of the production of other vegetable crops.</p> <p>Practice: Students will learn about the systems of vegetable production in greenhouses, various forms and types of greenhouses, various cover materials, various types of energy curtains, shading materials, substrates (organic and inorganic). In the exercises, students will be produce seedlings and then plant in protected area. Students will be trained to implement regular care measure, keeping the plants, removing leaves and sprouts, pruning blossom, tree pruning of pepper, nipping the tops of cucumbers, melons and watermelons. The tunnel type objects, students will access the planting of lettuce, tomatoes, peppers, cucumbers, squash, melons, watermelons, sowing of spinach, chard, leafy parsley, chives and other vegetable crops.</p>			
Required Reading: Howard, M.R. (2004). Hydroponic food production. Newconcept Pres, Inc., Mahwah, New Jersey			
Weekly Contact Hours: 4	Lectures: 3	Practical work: 1	
Teaching Methods: Practice/ Practical classes, research work			
Knowledge Assessment (maximum of 100 points): 100			
Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	

Practical work	5	oral exam	60
Preliminary exam(s)	10	
Seminar(s)	20		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			