

Numer modułu zgodnie z planem studiów	ZF S1_36C
Kierunek lub kierunki studiów	Herb crops and phytoproducts
Nazwa modułu kształcenia, także nazwa w języku angielskim	Fitoprodukty z upraw szklarniowych Greenhouse phytoproducts
Język wykładowy	English
Rodzaj modułu kształcenia obowiązkowy/fakultatywny	optional
Poziom studiów	stationary
Forma studiów	Beachelor's first degree
Rok studiów dla kierunku	III (year of study)
Semestr dla kierunku	5 (winter)
Liczba punktów ECTS z podziałem na kontaktowe/niekontaktowe	5 (2,6/2,4)
Tytuł/stopień, imię i nazwisko osoby odpowiedzialnej za moduł	dr hab. Andrzej Sałata, prof. UP
Jednostka oferująca moduł	Department of Vegetable and Herb Crops
Cel modułu	Acquainting students with irrigation system: surface, furrow, sprinkler and drip irrigation. Technology and characteristics of modern irrigation systems. Systems and technology irrigation used in orchard, nursery, vegetable and landscape. Acquainting with modern systems watering plants in greenhouse use and under plastic cover. The ability to mark the basic parameters of irrigation used for horticulture cultivation. Count of dates and doses of irrigation.
Treści programowe modułu kształcenia	Lectures Soil water management: three-phase system soil, soil phase, minerals, organic matter, forms of water in the soil, forces binding water in the soil. Movement of water in the soil: infiltration, filtration, wet soil water capillary, water evaporation from the soil. Useful retention and soil water balance. Water management plant: downloading and water movement in plants, transpiration. Plant water requirement in the field water consumption. Critical period of plants in water management. Water balance of plants. Methods of irrigation: sprinkler and drip irrigation. Sprinkler irrigation system. Periods and irrigation doses of rain water. Technology and characteristics of irrigation system. Drip (trickle) irrigation: drip system layout. Technology and characteristics of drip irrigation system. A single doses of hydration. Drip irrigation used in herbs and vegetables crops. Critical periods in water management. Methods of calculation of water requirement Watering plants in the greenhouse and under plastic cover (mulching). Specific adaptations to irrigation system. Fertigation in the greenhouse and plastic tunnels. Irrigation water quality for container-grown plants. Aquaponics - modern technology a bio-integrated system aquaculture with hydroponics flower, vegetable and/or herb production. Classes

	<p>Water availability in the soil. Practical used and interpretation of curve soil matric potential (pF). Calculation procedure for the crop evapotranspiration coefficient under standard and non-standard conditions. Results interpretation. Practical use of specialist software for irrigation management. Total amount of water to irrigation. Single doses of irrigation. Technology of sprinkler irrigation system. Count of single doses of micro-irrigation. Automatic irrigation based on soil moisture for vegetable crops. Marking the available water content of peat, marking the covering pH - neutralization curve.</p>
<p>Wykaz literatury podstawowej i uzupełniającej</p>	<ol style="list-style-type: none"> 1. Allen R.G., Pereira L.S., Raes D., Smith M., Crop evapotranspiration. FAO Irrigation and Drainer Paper, No 56. 2. Jensen, M.E., Burman, R.D., and Allen, R.G. (ed). 1990. Evapotranspiration and Irrigation Water Requirements. ASCE Manuals and Reports on Engineering Practices No. 70., Am. Soc. Civil Engrs., New York, NY, 360 p. 3. Burman, R. Pochop, L.O. 1994. Evaporation, Evapotranspiration and Climatic Data. Elsevier Science B.V., Amsterdam.
<p>Planowane formy/działania/metody dydaktyczne</p>	<p>The theory will be given by means of lectures. A syllabus and slides are available as study material. For the practical exercises the students will perform experiments and analyses in the lab. Extra demonstrations will be given.</p>