

Course Unit Descriptor

Study Programme: Soil, plant and genetics, module: Irrigation of agricultural crops		
Course Unit Title: Principles of irrigation		
Course Unit Code: 19.ZB6003		
Name of Lecturer(s): Borivoj Pejić, full professor; Ksenija Mačkić, associate professor		
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		
Number of ECTS Allocated: 5		
Prerequisites: none		
Course Aims: Education and training of students for understanding the basic principles in irrigation practice to achieve high and stable yields of growing plants, without harmful effects on soil properties.		
Learning Outcomes: Well-trained engineers who can successfully perform irrigation without harmful effects in the case of different growing plants and irrigation methods.		
Syllabus: <i>Theory</i> Principles of rational irrigation. Factors that condition irrigation. Crop water requirements: actual (ETR) and potential evapotranspiration (ETP). Transpiration coefficients, evaporation from the free water surface, determination of crop water requirements in field conditions, lysimeters, and evapotranspirometers. Calculation of crop water requirements by using reference evapotranspiration (ETo) and crop coefficients. Calculation of crop water requirements by using bioclimatic coefficients. Water balance and irrigation requirements. Assessing the quality of water for irrigation: chemical analyses and classifications (irrigation coefficient according to Stebler, classification of US Salinity Laboratory, classification according to Nejgebauer, residual sodium carbonate classification (RSC), physical properties (the influence of water temperature on crops and sediments in water on the soil). Agronomic evaluation of irrigation methods (surface irrigation: furrows, border, flooding, sub-irrigation, sprinkler irrigation, local irrigation: drip, micro sprinklers, and microtubes irrigation). Irrigation schedule: according to the soil moisture, morphological and physiological plant changes, critical growth stages, and the water balance approach. Irrigation in frost protection and cooling waterings. Exploitation elements of irrigated fields. <i>Practice</i> Irrigation scheduling aspects: according to the soil moisture, determination of the irrigation schedule based on an everyday calculation of water consumption through plants evapotranspiration, exploitation elements of irrigated fields: establishing intensity of sprinkling, determination of sprinkling diagram, uniformity of sprinkling, sprinkler irrigation losses.		
Required Reading: 1. Stewart, B.A. and Nielsen, D.R. (Eds.) (1990). Irrigation of Agricultural Crops. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison, Wisconsin, USA. 2. Lascano, R.J and Sojka, R.E. (Eds.) (2007). Irrigation of Agricultural Crops, Second edition. American Society of Agronomy, Crop Science Society of America, Soil Science Society of America, Madison, Wisconsin, USA.		
Weekly Contact Hours:	Lectures: 3	Practical work: 2
Teaching Methods:		

Lectures, practical classes, consultations, research work			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Test	10	oral exam	60
Practical exam	30		