

Course Unit Descriptor

Study Programme: Precision agriculture			
Course Unit Title: Remote Sensing in Agriculture			
Course Unit Code: 19.PRP017			
Name of Lecturer(s): Assoc. Prof. Atila Bezdán, PhD; Prof. Pavel Benka, PhD; Assoc. Prof. Milica Vranešević, PhD			
Type and Level of Studies: Graduated-Master			
Course Status (compulsory/elective): Elective			
Semester (winter/summer): 1 (winter)			
Language of instruction: English			
Mode of course unit delivery (face-to-face/distance learning): face-to-face			
Number of ECTS Allocated: 6			
Prerequisites: None			
Course Aims: Introducing students with a modern approach to the application of Remote Sensing in agriculture and related fields.			
Learning Outcomes: Enabling students to apply the acquired knowledge in the further process of education as well as in future professional work and engineering problem solving.			
Syllabus: <i>Theory</i> Introduction, remote sensing data collections: satellite imagery, aerial imagery, UAV imagery, data from sensors from agriculture machines and hand-held devices. Sensors type, sensor characteristic: spatial resolution, spectral resolution, radiometric resolution and temporal resolution. Satellite imagery, applications and sensors characteristic of individual application. Spectral ranges, calculation of various vegetation indices (NDVI, NDWI, EVI, SAVI, ...), importance of vegetation indices in agriculture. Classification of satellite imagery, supervised classification and unsupervised classification. Aerial imagery, characteristic of aerial-photogrammetry camera. UAV imagery, UAV types, features of UAV camera. UAV flight planning, orientation of photogrammetric images from UAV. Possibilities of using images from UAV for remote sensing in agriculture. Measurement the spectral response of vegetation with a high-resolution hand-held spectroradiometer. <i>Practice</i> Elaborate preparation – seminar paper that includes an independent spatial analysis and classification based on collected satellite images, images from UAV and data from hand-held spectroradiometer. Field exercises: preparation for UAV survey, flight planning, surveying an area with UAV. Data collection with hand-held sensors .			
Required Reading: Bezdan A., Benka P., Vranešević M.: Basics of remote sensing – script Čupković T., Pavlović R., Marković M.: Remote Sensing, University of Belgrade, Faculty of mining and geology, 2004. González, F.E., Riuz, M.J., Acosta, F.M.: Remote Sensing Tutorial, Universitas de las Palmas de Gran Canaria, 2006. Manuals for Remote Sensing applications.			
Weekly Contact Hours:		Lectures:	
		Practical work:	
Teaching Methods: Lectures and Practical classes in computer room, , Field exercises ,Elaborate preparation, Consultations.			
Knowledge Assessment (maximum of 100 points):			
Pre-exam obligations	points	Final exam	points
Active class participation	5	written exam	15
Practical work		oral exam	30
Preliminary exam(s)		
Seminar(s)	50		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			