Course Unit Descriptor

Study Programme: Agriculture engineering and information technology

Course Unit Title: Precision agriculture

Course Unit Code: 19.PTI042

Name of Lecturer(s): Marko Kostić

Type and Level of Studies: Undergraduate academic studies

Course Status (compulsory/elective): elective

Semester (winter/summer): summer

Language of instruction: serbian/english

Mode of course unit delivery (face-to-face/distance learning): face-to-face

Number of ECTS Allocated: 6

Prerequisites: no

Course Aims:

To enable students to apply technical-technologically advanced systems that precision agriculture entails.

Learning Outcomes:

Students will be trained to work with devices and software packages used in precision agricultural production of field crops. They will be trained to work with sensor devices for proximal detection of soil parameters, to work with software packages for geospatial data processing and visualization and interpretation of results.

Syllabus:

Theory

Students will get acquainted with the basic elements applied in precision agricultural production, such as the global positioning system (GPS, GNSS), yield recording devices, the strategy and method of soil sampling, remote sensing, proximal sensing systems, the use of a geographic information system (GIS) in parameter spatial modeling and systems for variable application (VRA). In addition to the aforementioned, they will be introduced to systems for monitoring and remote control of the operation of machines in the field using telematics. Students will be trained to work in appropriate software packages for analysis and generation of yield maps, soil characteristics, making recommendations for solving the causes of variations on the plot, for developing a strategy for improving the general condition of the plot as well as evaluating the economic feasibility of applying a certain technology.

Practice

Application of available sensor devices in the field. Data collection according to the principles of precision agriculture. Mastering data acquisition and processing techniques. Signal processing using interpolation and filtering techniques. Variogram modeling, selection of data interpolation methods, cross-correlation of models, creation of thematic maps.

Required Reading:

1. Kostić M. Precision agriculture, University of Novi Sad, 2021.
2. Kostić M., Rakić D., Savin L., Dedović N., Simikić M. 2016. Application of an original soil tillage resistance sensor in spatial prediction of selected soil properties. Computers and Electronics in Agriculture, 127(2016): 615-624.
3. Kostić, M., Rajković, M., Ljubičić, N. et al. Georeferenced tractor wheel slip data for prediction of spatial variability in soil physical properties. Precision Agric (2021).

Weekly Contact Hours:	**Lectures:2**	**Practical work:2**

Teaching Methods:

Oral lectures with the use of modern equipment for visual display and simulation. Practical exercises on machines with demonstrations in laboratory and field conditions.

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	points	**Final exam**	points

Active class participation	5	written exam	
Practical work	5	oral exam	60
Preliminary exam(s)	15	…….	
Seminar(s)	15		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			