

Course Unit Descriptor

Study Programme: Agricultural engineering and information systems		
Course Unit Title: Automatic and agoinformation technologies		
Course Unit Code: 19.PTI020		
Name of Lecturer(s): Jan J Turan, PhD, Full Professor		
Type and Level of Studies: Bachelor degree		
Course Status (compulsory/elective): compulsory		
Semester (winter/summer): summer		
Language of instruction: English		
Mode of course unit delivery (face-to-face/distance learning): face to face		
Number of ECTS Allocated: 5		
Prerequisites: Mathematics, Information systems in agriculture, Electrical engineering and electrical machines		
Course Aims: Acquaintance of students with the principles of automatic management of processes in agricultural production.		
Learning Outcomes: Students will be able to understand the principles of operation and functioning of automatic management systems and to independently manage automated processes in agriculture.		
<p>Syllabus:</p> <p><i>Theory</i></p> <p>Basic terms and principles of automatic control. Types of management, division of automatic management systems. Analysis and synthesis of automatic control systems. Selection and setting of PID controller parameters. Software packages for simulation, analysis and synthesis of automatic control systems. Digital management systems. Automation of technological processes in agriculture using Arduino components. Basics of programming for simple control systems. Implementation of simple management systems in the fields of agricultural production, farming, vegetable growing, fruit growing, viticulture and animal husbandry. Application of agro-information technologies in agriculture.</p> <p><i>Practice</i></p> <p>Computational and laboratory exercises. Familiarity with software packages for analysis, synthesis and simulation of automatic control systems. Demonstration of operation and practical adjustment of the control system. Practical formation and programming of simple systems for measurement and management in the field of agriculture. Systems of measurement and control of production and harvesting processes in agricultural production. Measurement, control and data transfer between all factors in agricultural production.</p>		
<p>Required Reading:</p> <p>Stojić M. 2000. Kontinualni sistemi automatskog upravljanja, Naučna knjiga, Beograd</p> <p>Dorf R. C, Bishop R. H. 2001. Modern Control Systems, Prentice Hall, New Jersey</p> <p>Jeremy Blum, 2013: Exploring Arduino – Tools and Techniques for Engineering Wizardry, Wiley, Indianapolis, USA, ISBN: 978-1-118-54936-0</p> <p>Brian Evans, 2011: Beginning Arduino Programming – Writing Code for the Most Popular Microcontroller Platform in The World, Apress, New York, USA, ISBN: 978-1-4302-3777-8</p>		
Weekly Contact Hours: 4	Lectures: 2	Practical work: 2

Teaching Methods:

Teaching is conducted through lectures and exercises. Methods of presentation, demonstration, simulation are used. Consultations and seminar papers. Part of the exercises is performed in the laboratory

Knowledge Assessment (maximum of 100 points):

Pre-exam obligations	Points	Final exam	Points
Active class participation	10	written exam	
Practical work	10	oral exam	40
Preliminary exam(s)		
Seminar(s)	40		

The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.