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**MINISTRY OF AGRICULTURE OF THE REPUBLIC OF KAZAKHSTAN**  
**S. Seifullin Kazakh Agrotechnical University**

**WORK PROGRAM**

**training -seminar for advanced training, within the framework of the project  
NICOPA “New and Innovative Courses for Precision Agriculture” 597985-  
EPP-1-2018-1-KZ-EPPKA2-CBHE\_JP**

**Total Hours:72**

**Target audience:** employers, students, and lecturers of Technical, Agronomy,  
Land Management and Forestry Faculties

Координатор проекта  
ЕС Эразмус+ NICOPA

Контактное лицо



И. Токбергенов

С. Китайбекова

**Astana, 2022**

**Information about lecturers:**

**Nukeshev Saykhat** – PhD, the Dean of Technical Faculty

**Almanova Zhanna**- PhD, the Head of Soil Science Department

**Baitelenova Aliya** – PhD, the Head of Plant Growing Department

**Alippebi Ongarbek** – PhD, Professor of Land Management Faculty

**The purpose of the course-** to improve and obtain professional competencies that ensure the ability to apply precision farming systems in agricultural production

**The objectives of the course** are to familiarize students with precision farming technologies in the production of crops to obtain maximum yield, minimize capital investments, maximize financial benefits, and minimize environmental impact, as well as develop in students the ability to monitor yields, special instruments, and equipment as basic elements of precision agriculture.

**Category of listeners:** The course program is designed for managers and workers in the agricultural sector, persons receiving higher or postgraduate education, as well as university lecturers.

**Main contents of the program:**

- Fundamentals of soil science, cartography, and geography of soils;
- Historical background for the emergence of precision agriculture;
- Technologies for mapping and land assessment;
- Precision farming technologies;
- Nuances of introducing precision farming technologies;
- Equipment and electronics for precision farming;
- Assessing the cost-effectiveness of precision material application technologies

**Training duration:** 72 hours

Educational and thematic plan for advanced training seminars

**Educational program “Precision Agriculture”**

No	Topic and content	Number of hours
<b>Module 1.</b>		
1.	Fundamentals of soil science, cartography and soil geography: -Zonal principle of soil cover formation; -Soil-forming factors. Soil structure; - Diversity of soils and their influence on the biological productivity of crops. The main zonal soils suitable for cultivation and their waterlogged analogs; -What is soil fertility and can it be leveled? -Comparative assessment of the influence of agrophysics, relief and agrochemistry on the yield of crops.	12
<b>Module 2.</b>		
2.	Historical background for the emergence of precision agriculture: -History of the emergence of precision agriculture; - Analysis of the current situation with precision farming in Kazakhstan and in the world	10
<b>Module 3.</b>		
3.	Technologies for mapping and land assessment: -Agrochemical examination; -Agrophysical survey; -Comprehensive soil survey; Other ways to value land; -Use of GIS technologies	12
<b>Module 4.</b>		
4.	Precision farming technologies:	10

	<ul style="list-style-type: none"> <li>- Review of existing precision farming technologies (differentiated fertilization, differential sowing, mapping of soil conditions, yield mapping);</li> <li>- Determination of soil degradation</li> </ul>	
<b>Module 5.</b>		
	<p>The nuances of introducing precision farming technologies:</p> <ul style="list-style-type: none"> <li>- Main mistakes when introducing precision farming technologies;</li> <li>- Environmental, image and investment feasibility of introducing precision technologies</li> </ul>	10
<b>Module 6.</b>		
	<p>Equipment and electronics for precision farming:</p> <ul style="list-style-type: none"> <li>- Equipment for precise application of fertilizers and seeds;</li> <li>- Application of IT technologies in the operation of agricultural machinery</li> </ul>	10
<b>Module 7.</b>		
	<p>Assessment of the economic efficiency of precision material application technologies:</p> <ul style="list-style-type: none"> <li>- Methods for setting up field experiments, taking into account intra-field heterogeneity;</li> <li>- Methodology for calculating economic efficiency</li> </ul>	8
	<b>TOTAL:</b>	72