Sari Agricultural Sciences and Natural Resources University (SANRU)

Fostering Internationalisation in AgRicultural Engineering in Iran and Russia
FARmER

Co-funded by the Erasmus+ Programme of the European Union

Title: Introduction to Agro-Mechatronics and Automation of agricultural equipment

Course goals:

1. To familiarize all students of agriculture with agro-mechatronics.
2. Introducing new and intelligent systems in modern agriculture.
3. Applying new concepts such as artificial intelligence and neural network in identifying and diagnosing plant diseases and food quality.

Academic level of course participants and prerequisite concepts:

The concepts of this course are designed to apply to all undergraduate agricultural students with basic knowledge of agricultural science and agricultural basics.

Course content:

The course is designed in three parts: theory, practice and visit.

Course of Theory: Applied theory concepts including familiarizing students with the automation of industrial equipment, agriculture, food industry and pneumatic and hydraulic components of automated control systems, proximity sensors, controllers, robotics in agriculture, artificial intelligence and Hyperspectral Imaging in quality assessment of agricultural products and food.

Practical Course: Practical work in advanced and equipped Agro-mechatronics lab, visiting agricultural equipment factory, visiting large mechanized fields (e.g., visiting Agro-industry Complex of Dashtanaz)

Visiting plan: Visiting the cultural and touristic centers of Mazandaran province

Time Schedule: The schedule of the one-week training course is presented in the following table.

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Day #1: Saturday, February 08 2020,

Further Details	Title of presentation	Speaker	Time
	Welcome program and description of university activities	Assoc. Prof. Dr. A. Teimouri-Yansari	9-9:20
	Current and future plans of International Scientific Cooperation Office (ISCO) of the University	Assoc. Prof. Dr. M. Masoudian	9:20-9:40
	Welcome and Introducing Biosystems Engineering Research Group	Assoc. Prof. Dr. S.R. Mousavi-Seyedi	9:40-10
	Coffee Break	==========	10-10:30
	Introduction to artificial intelligence and its applications in agriculture	Dr. S. Sabzi (Post. Doc)	10:30-12
	Lunch and Prying		12-13:30
Practical course	Working with artificial neural network toolbox in Matlab	Dr. S. Sabzi	13:30-15
Practical course	Implementation of simple artificial neural network project in Matlab	Dr. S. Sabzi	15-16
	City Tour: Visiting historic parts of Sari and markets (Bazar)		16-20

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Day #2: Sunday, February 09, 2020

Further Details	Title of presentation	Speaker	Time
	Introduction to Hyper Spectral Imaging and its applications in agriculture and food industry	Dr. Sajad Kiani (Post. Doc)	8:30-10
	Coffee Break		
Practical course	Introducing the Hyper Spectral Imaging camera, setting up and installing of the device	Dr. Sajad Kiani	10:30-12
	Lunch and Prying		12-13:30
Practical course	Perform a practical project with Hyper Spectral Imaging camera and interpret the results	Dr. Sajad Kiani	13:30-15
	Visiting the Caspian Sea Coast: Recreation Complex of Farah Abad		15-20

Day #3: Monday, February 10, 2020

Further Details	Title of presentation	Speaker	Time
	Application of Mechatronic systems in tillage		8:30-10
	Coffee Break		
	Arduino and its applications in Agro-mechatronics	Assoc. Prof. Dr. S.R. Mousavi-Seyedi	10:30-12
	Lunch and Prying		12-13:30
Practical course	Arduino and its applications in Agro-mechatronics-continue	Assoc. Prof. Dr. S.R. Mousavi-Seyedi	13:30-15
	Hydraulic and Pneumatics equipment and circuits for automated control purposes	Assoc. Prof. Dr. D. Kalantari	15-18

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Day #4: Tuesday, February 11, 2020

Free Day: Suggested Schedule: Visit Namak-Abrood Tourism Area

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Day #5: Wednesday, February 12, 2020

Further Details	Title of presentation	Speaker	Time
	Introduction to Industrial Control, Automation and PLC	Dr. M. Hosseingholizadeh	8:30-10
	Coffee Break		
Practical course	Application of proximity sensors and motion detection in automated control systems	Assoc. Prof. Dr. D. Kalantari	10:30-12
	Lunch and Prying		12-13:30
Practical course	PLC Automation Programming	Dr. M. Hosseingholizadeh	13:30-15
Practical course	implementation of PLC-assisted automation projects in the laboratory	Dr. M. Hosseingholizadeh	15-16:30
	Completion Ceremony and Certification		16:30-17:30