



Course Syllabus Secon Semester, Academic Year 2024

1. Faculty of Agriculture at Kamphaeng Saen Department of Farm Mechatronics

2. Course code: 02027462

Credit: 3(2-3-6)

Pre: 02027461

Course name: Agricultural

Mechatronics II

3. Instructor team:

Mr. Pavit Tangwongkit

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4. Providing students with access to and advice outside of class hours:

Working days during official hours, except during teaching periods or when on official business outside of the premises. In case of emergency, students can contact us via Line group or Mobile phone.

5. Course Objectives:

5.1 Students can and apply advanced embedded systems to communicate with agricultural equipment that needs to be controlled.

5.2 Students can create works that use advanced embedded systems to communicate and control devices related to agricultural machinery and technology as desired.

5.3 Students are responsible, honest, and can work with others.

6. Course Description

Advanced principle for development of embedded systems, communication and application between embedded systems with equipment related to agricultural machinery and mechatronics.

7. Program Learning Outcomes: PLOs (7PLOs of the 2017 AMM revised curriculum)

PLOs	Knowledge	Specific skills	Generic skills	Attitude
PLO4: Be able to search pursue academic progress and integrate knowledge of agricultural machinery and technology in agriculture.	<ul style="list-style-type: none">- Apply advanced embedded systems- Advanced embedded systems to control devices- Create websites using JavaScript that can communicate with embedded systems	<ul style="list-style-type: none">- Programing skill to apply advanced embedded systems- Have skills in summarizing and discussing the results of the analysis- Have systematic thinking skills-Have skills in working and solving problems that occur-Have skills in communication and presenting work- Have skill in websites creation by using JavaScript	<ul style="list-style-type: none">- Follow the movement of news and information on agricultural academics related to the subject- Have a passion for the profession and the institution that study.-Technical academic vocabulary (in English) in the field of mechatronic-Computer and IT skills in agriculture.	<ul style="list-style-type: none">- Be responsible- Punctuality- Honesty.- Ability to work collaboratively with others.- Develop a passion for the profession- Has a passion for the profession - Keeping up with relevant academic news and information.

PLO5: Be shown to morality, ethics, discipline, punctuality, honesty, responsibility towards oneself and society.	- University regulations for higher education of Kasetsart University	Able to appropriately adjust behavior during internship training. Possesses a positive attitude toward oneself, others, and society.	- Behave appropriately and serve as a good role model - Comply with university regulations and refrain from misconduct - Participate in various activities with intention and willingness	- Be responsible - Punctuality - Honesty. - Ability to work collaboratively with others. - Develop a passion for the profession
PLO6: Be able to communicate their knowledge of agricultural machinery and technology which is appropriate to both in the academic section and the agricultural community.	-Presentation techniques in both writing and oral delivery. -Able to use technical terminology in both Thai and English.	- Able to present academic progress in agricultural mechatronic - Able to use academic terminology (in Thai and English) related to agricultural mechatronic - Able to explain agricultural mechatronic knowledge to local communities.	- Confidence in presentation - Safety in work practices	
PLO7: Be able to work with others as good leaders and members, and able to adapt to different situations appropriately.		- Interpersonal skills for working with others and the ability to work effectively as part of a team. - Leadership and followership skills, with a willingness to listen to colleagues' opinions. - Problem-solving skills in various situations.	- Possess presentation skills and the ability to listen to colleagues' opinions	- Has a positive attitude toward living and working with others. - Adapts appropriately to different environments.

8. Course Learning Outcomes (CLOs) and Methods for measuring learning outcomes:

Course Learning Outcomes: CLOs	Methods for measuring learning outcomes	PLOs
CLO1: Able to apply advanced embedded systems to communicate with agricultural equipment that needs to be controlled. CLO2: Able to create works that use advanced embedded systems to communicate and control devices related to agricultural machinery and technology as desired. CLO3: Able to create websites using JavaScript that can communicate with embedded systems CLO4: Able to design of robotic arm movement path	1. Observe behavior, assess work skills, and provide advice during the operation 2. Evaluate assignment and project results 3. Classroom presentation	PLO4 PLO5 PLO6 PLO7
CLO5: Students are responsible, moral, ethical, disciplined, punctual, honest, and responsible for themselves and society.	4. Observing behavior, attending class, punctuality, providing feedback 5. Submitting assigned work on time and the quality of assigned work	PLO5
CLO6: Able to present a prototype to solve agricultural problems with embedded systems completely and correctly.	6. Presentation, answering questions and solving problems using appropriate language and IT technology for both individual and group work.	PLO6
CLO7: Have the skills to work with others as a good leader and a member and can adapt to various situations appropriately.	7. Observing behavior, teamwork and leadership-followership.	PLO7

9. Academic achievement measurement

9.1 Students must attend both lectures and practical classes for at least 80 percent of the total class time.

9.2 Assessment criteria and academic achievement measurement

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|---|-------------|
| 1) Assessment of skills and learning outcomes (at the end of every chapter) | 50% |
| 2) Measuring learning outcomes from project-based learning (Term Project) | 40% |
| 3) Interest in learning, determination to practice, responsibility and teamwork | 10% |
| Total | 100% |

Score level	>80	75-79	70-74	65-69	60-64	55-59	50-54	<50
Grade	A	B+	B	C+	C	D+	D	F

10. Documents to read:

Books, research reports, articles, and other relevant and up-to-date documents as assigned

11. Evaluation of teaching results:

From the student's questionnaire, students must evaluate their teaching results at www.kps.ku.ac.th (go to Students, Teaching System) with the university's teaching evaluation form before the mid-term and final exams.

12. Review to improve teaching methods and teaching systems:


- ☒ **No review because students were satisfied with the teaching in the previous session with a score of 4.82 and had no suggestions for improvement.**
- ☐ Reviewed by reviewing from.....
- ☐ Not revised.....
- ☐ Revised to be consistent with.....

13. Teaching improvement from teaching evaluation results:

- ☐ No teaching evaluation
- ☒ **Teaching evaluation, the average score of the previous evaluation is equal to 4.82.**
- ☒ **No improvement,**
- ☐ Improvements as follows.....

14. Schedule of activities related to teaching and learning (see Table 1)

Signature


(Mr. Pavit Tangwongkit)
18 November 2024

14. Schedule of activities related to teaching and learning of 02027462

Friday: lecture 13:00-15:00 Laboratory 14:00-18:00 at the Computer & Mechatronic lab, Agricultural Mechatronics Laboratory Building.

No.	Lesson	LLOs	L-level	Teaching/Learning method	Assessment	Lecturer	CLOs	PLOs
1	-Explain Course Syllabus	-Explain the key components of the microcontroller board -Explain the use of Digital Output	K: An S: Pre A: Val	- Explain and make agreement with students on the content/method/learning assessment according to the Course Syllabus and have students download from Google classroom or EduFarm - Explain and ask students questions to check their understanding of the specified topics		Pavit Chalvalit	CLO5 CLO6 CLO7	PLO4 PLO5 PLO6 PLO7
2	-Explain the principles of programming to communicate with embedded systems	-Explain the basic working principles of a website -Create a basic website using HTML		- Lecture in the lecture room - Practice creating a basic website with HTML language	- Evaluate website creation skills	Pavit	CLO4 CLO5 CLO6 CLO7	
3-5	Programming to create communication systems between users and embedded systems	- Able to design websites - Able to create basic websites with HTML and CSS		- Lecture in the lecture room - Practice designing and creating basic websites with HTML and CSS	- Evaluate web design and creation skills			
		- Able to design websites - Able to create basic websites with Javascript		- Lecture in the lecture room - Practice designing and creating basic websites with JavaScript				
		- Design websites - Create websites using Javascript that can communicate with embedded systems		- Lecture in the lecture room - Practice designing and creating basic websites using JavaScript that can communicate with embedded systems				
6	Using robotic arms with automation systems	- Meaning and types of robots - Ability, application and safety - Simulate robot movement in Robot Studio		- Lecture in the lecture room - Practice controlling the robotic arm using Virtual Flex Pendant	-Assess students' practical skills and provide guidance during the practice	Chalvalit	CLO1 CLO2 CLO4 CLO5 CLO6 CLO7	
7-9	Using a robotic arm simulation program with automation	- Coordinate system in robot - Robot control - Robot movement simulation in Robot Studio		- Lecture in the lecture room - Practice controlling the robotic arm using the robotic arm writing simulation program	-Assess skills in controlling writing on the robotic arm			

No.	Lesson	LLOs	L-level	Teaching/Learning method	Assessment	Lecturer	CLOs	PLOs
		<ul style="list-style-type: none"> - Design of robotic arm movement path - Write in the program with basic commands 		<ul style="list-style-type: none"> - Lecture in the lecture room - Practice writing the robotic arm control program using the robotic arm movement simulation program 	-Assess skills in programming skills controlling writing on the robotic arm			
		<ul style="list-style-type: none"> - Design the path of the robotic arm with the workpiece created from the drafting program - Apply the movement of the robotic arm with the workpiece 		<ul style="list-style-type: none"> - Lecture in the lecture room - Practice writing a repetitive robotic arm control program using a robotic arm movement simulator 	-Assess skills in programming control writing on the robot arm			
10	Basic operating principles and equipment for use with PLC	<ul style="list-style-type: none"> - Explain the components of the PLC - Explain the basic working principles of the PLC 		<ul style="list-style-type: none"> - Lecture in the lecture room - Practice writing a basic PLC control program 	-Assess skills in programming control PLC	Pavit	CLO 1 CLO 2 CLO5 CLO6 CLO7	
11-13	Programming to work with PLC	<ul style="list-style-type: none"> - Write PLC control program for Output control 		<ul style="list-style-type: none"> - Lecture in the lecture room - PLC Output Control Programming Operation 	PLC programming skills assessment			
		<ul style="list-style-type: none"> - Write PLC control program for complex Output control using Ladder Diagram 		<ul style="list-style-type: none"> - Lecture in the lecture room - Perform complex PLC Output Control Programming 				
		<ul style="list-style-type: none"> - Write PLC control program for Output and Input control 		<ul style="list-style-type: none"> - Lecture in the lecture room - Perform programming to control PLC Output and Input. 				
14-15	PLC Applications	<ul style="list-style-type: none"> - Design PLC control system that can be applied in real life 		Present Team Project				