Lab Work 10 for Engineering Design Practice for Mechatronics

Basic Course Information

Course Number	01005130	Subject Category	Compulsory (M)
Class Format	Experiment / Practical traini	Credit Type and Number of Credits	1.5
Department	Mechatronics	Student Category	Year 5
Period of Study	Semester 2	Classes per Week	1
Required Materials			
Instructor	Thanapol Luckanawat	Kashine Kenji	Sureeporn Numsumlee

Course Objective

Evaluation(Rubric)

Evaluation(Rubric)	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Following and doing procedure	Demonstrates very good knowledge of the lab procedures and principles	Demonstrates good knowledge of the lab procedures and principles	Lacks the appropriate knowledge of the lab procedures and principles
Data collection	Measurements are both accurate and precise	Measurements are mostly accurate and precise	Measurements are incomplete inaccurate and imprecise
Report writing	Content is comprehensive, and accurate. Important points are stated clearly with supported data	Some contents is not comprehensive or incomplete. Important points are addressed, but not well supported	Most of the contents is incomplete. Important points are addressed and/or inconsistent
Safety	Proper safety precautions and awareness are consistently used	Proper safety precautions and awareness are generally used	Proper safety precautions and awareness are missed

Relationship with Learning Outcomes

M(1) Ability to design, propose and develop robotic/ mechatronic systems to solve specific problems

M(3) Ability to design, propose and develop mechanical solutions/ systems for robotic/ mechatronic systems

M(5) Ability to design, propose and develop network systems to control robotic/ mechatronic systems.

Teaching Method

Outline:	Students will learn the basics of automation technology with an emphasis on 4.0 technologies currently in use in industry. Emphasis is placed on allowing students to practice real work. To enable students to apply knowledge to their future work.
Class Format:	Lecture, Practice and Homework Assignments
Please Note :	

Course Plan

Semester 2	Contents and Method of Course	Goals	Related MCC V-D 4 1
1st week	Guidance, Basic of Inverter (Principle of inverter, advantage of inverter, examples of industrial applications and other related) and practice using inverter with other equipment	To be able to explain the principles and things related to inverters, and can operate the inverter	
2nd week	Principle of servo motor (AC servo fundametals, replacement of servo, structure and wiring system and other related) and practice using servo motor with other equipment	To be able to explain the principles and things related to servo motor, and can operate the servo motor	
3rd week	Pneumatic system (pneumatic system structure, various equipment, pneumatic system operation and simulation of pneumatic system) and practice with pneumatic system	To be able to explain the principles and things related to pneumatic system, and can operate the pneumatic system	
4th week	Integrate automation system such as HMI to PLC to Inverter, HMI to PLC to servo motor and Colse loop control motor with encoder etc.	To be able explain various equipment in automatic system and can be operated together	
5th week	Encoder (what is encoder, type of encoder, mechanical installation, electrical interface, choosing encoder and other related), Practice using encoder, get encoder values using PLC and measuring encoder signals.	To be able to explain the principles and things related to encoder, and can operate the encoder	
6th week	Rotation Lab FA Device (Factory Automation) (such as inverter, servo motor, pneumatic system and HMI-PLC control motor with encoder etc.)	Have design knowledge and skills Implementation of integration of various technologies in automatic system	
7th week	Rotation Lab FA Device (Factory Automation) (such as inverter, servo motor, pneumatic system and HMI-PLC control motor with encoder etc.)	Have design knowledge and skills Implementation of integration of various technologies in automatic system	
8th week	Midterm Exam.		
9th week	School Event.		
10th week	Monday class		
11th week	Rotation Lab FA Device (Factory Automation) (such as inverter, servo motor, pneumatic system and HMI-PLC control motor with encoder etc.)	Have design knowledge and skills Implementation of integration of various technologies in automatic system	
12th week	Rotation Lab FA Device (Factory Automation) (such as inverter, servo motor, pneumatic system and HMI-PLC control motor with encoder etc.)	Have design knowledge and skills Implementation of integration of various technologies in automatic system	
13th week	Learning the Automation Process system Wiring / Process / Robot /	Have knowledge and skills in Automation Process systems	
14th week	Learning the Automation Process system Wiring / Process / Robot /	Have knowledge and skills in Automation Process systems	
15th week	Learning the Automation Process system Wiring / Process / Robot /	Have knowledge and skills in Automation Process systems	
16th week	Learning the Automation Process system Wiring / Process / Robot /	Have knowledge and skills in Automation Process systems	
17th week	Learning the Automation Process system Wiring / Process / Robot /	Have knowledge and skills in Automation Process systems	
18th week	Learning the Automation Process system Wiring / Process / Robot /	Have knowledge and skills in Automation Process systems	
19th week	Final Exam.		
20th week	Return Exam Papers and Feedback, and special sessions	Review and summarize learning	

Do not

	Examination	Quiz	Mutual Evaluations between students	Report	Portfolio	Other
Basic Ability						
Technical Ability						
Interdisciplinary Ability						