

Lab work 1 for Introduction to Robotics

Basic Course Information			
Course Number	01005121	Subject Category	Conculatory IM
Class Format	Experiment / Practical training	Credit Type and Number of Credits	1.5
Department	Mechatronics	Student Category	Year 1
Period of Study	Semester 1	Classes per Week	1
Required Materials	Laptop or hand tablet for writing reports and recording measurements		
Instructor	Armin Saberkhanlou	Hours/Practicals	

Course Objective
 The course covers fundamental topics and activities in engineering lab work, such as basic electrical measurements (such as voltage, current, and resistance), as well as report writing. The goal of this course is to provide students with a strong foundation in lab work skills that will enable them to formulate, analyze, and solve engineering problems. In addition, to help develop their general engineering skills, students will assemble electrical testers using the Sanwa KR-80.

Evaluation(Fabric)	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/or noisy
Report writing	Content is comprehensive, and accurate. Important points are stated clearly with supported data.	Some contents are not comprehensive or incomplete. Important points are addressed, but not well supported.	Most of the content is incomplete. Important points are addressed and/or incomplete.
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
G(1) Wide knowledge on Science and Engineering and practical ability to apply them to solve problems in the society.
G(2) As an engineer, attitude to act with awareness of social roles and responsibility to make a better society.
M(1) Ability to design, process and develop robotic/ mechatronic systems to solve specific problems

Teaching Method	
Outline	Students will conduct some measurements and assembling tester kits
Class Format	Labwork
Please Note :	Complying with safety rules. Lab work topics are subject to be changed due to the school schedule. All reports must be submitted and accepted to get the credit.

Course Plan	Semester 1	Contents and Method of Course	Goals	Related MCC	
				W-A	V-C
1st week		Introduction / Lab environment and safety	Understanding and familiar with the substance, lab environment, and safety	W-A 1 1 W-A 1 2	
2nd week		Analog multimeter kit and soldering practice (1)	Understanding the analog multimeter kit and its parts, and soldering skill	W-A 1 1 W-A 1 2 W-A 1 3	
3rd week		Analog multimeter kit and soldering practice (2)	Understanding the analog multimeter kit and its parts, and soldering skill	W-A 1 1 W-A 1 2	
4th week		Analog multimeter kit assembly (1) Resistors and Diode	Understanding the analog multimeter kit and its parts, and soldering skill	W-A 1 1 W-A 1 2	
5th week		Analog multimeter kit assembly (2) Other parts	Understanding the analog multimeter kit and its parts, and soldering skill	W-A 1 1 W-A 1 2	
6th week		Analog multimeter kit assembly (3) Quality Check (1)	Understanding its operation and the checking process	W-A 1 1 W-A 1 2 W-A 1 3	
7th week		Analog multimeter kit assembly (4) Quality Check (2)	Understanding its operation and the checking process	W-A 1 1 W-A 1 2 W-A 1 3	
8th week		Ohm's law and I-V characteristic	Understanding Ohm's law and being capable of using engineering equipment to measure	V-C 6 84 V-C 6 85 W-A 1 20	
9th week		Wrap up and Report			
10th week		Midsem examination			
11th week		Voltage division and multiplier (1)	Understanding the voltage division, multiplier, and capability to use the engineering equipment to measure and analysis	W-C 1 1 W-C 1 2 W-C 1 4 W-C 1 6	
12nd week		Voltage division and multiplier (2)	Understanding the voltage division, multiplier, and capability to use the engineering equipment to measure and analysis	W-C 1 1 W-C 1 2	
13rd week		Current division and multiplier (1)	Understanding the current division, multiplier, and capability to use the engineering equipment to measure and analysis	W-C 1 4 W-C 1 6	
14th week		Current division and multiplier (2)	Understanding the current division, multiplier, and capability to use the engineering equipment to measure and analysis	W-C 1 1 W-C 1 2	
15th week		Breadboard and potentiometer	Understanding the breadboard function and making a circuit with a potentiometer to measure and analysis	W-C 1 4 W-C 1 6	
16th week		Internal resistance and battery	Understanding the internal resistance and battery, and realize the limitation of the battery	W-C 1 1 W-C 1 2 W-C 1 6	
17th week		Diode and rectifier	Understanding how diode works and its application	W-C 1 4 W-C 1 6	
18th week		Wrap up and Report			
19th week		Final examination			
20th week		Review and summarize	Review and summarize		

Do not

	Qualification	Grade	Mark Reductions between systems	Report	Portfolio	Process
Basic Ability						10
Technical Ability						20
Entrepreneurial Ability						10