

# Lab work 3 for Robotics

Basic Course Information			
Course Number	01005123	Subject Category	Concoursatory IM
Class Format	Experiment / Practical train	Credit Type and Number of Credits	1.5
Department	Mechatronics	Student Category	Year 2
Period of Study	Semester 1	Classes per Week	3
Required Materials			
Instructor	Sant Teawchim		

**Course Objective**  
 The course covers the fundamental engineering lab work topics and activities such as basic electric measurements (i.e. voltage, current, and resistor) for general engineering as well as report writing. This course aims to build the strong foundation in lab work skills of students needed to formulate, to analyze, and to solve engineering problems. To develop general engineering skills.

Evaluation Rubric	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Following and Doing Procedure	Ideal Level of Achievement (Very Good) Demonstrates very good knowledge of the lab procedures and principles	Standard Level of Achievement (Good) Demonstrates good knowledge of the lab procedures and principles	Unacceptable Level of Achievement (Fail) 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 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 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, process and develop robotic/ mechatronic systems to solve specific problems
  - M(2) Ability to design, process and develop electrical and electronic systems for robotic/ mechatronic systems
  - M(3) Ability to design, process and develop mechanical solutions/ systems for robotic/ mechatronic systems

Teaching Method	
Outline:	Students will study the concept and methodology of Electrical Engineering and Mechanical Engineering. Student will apply their skills, knowledge and learning without equipment.
Class Format:	Experiment
Please Note:	Students are required to ask any questions after sufficient self-learning

Course Plan	Semester 1	Contents and Method of Course	Goals	Related MCC
Week 1		Introduction of course and Pendulum and oscillation	Understanding Introduction of course and Pendulum and oscillation	W-C 1 3
Week 2		Simple vibration of metal bar (1)	Understanding Simple vibration of metal bar (1)	W-C 1 3
Week 3		Simple vibration of metal bar/ resonance (2)	Understanding Simple vibration of metal bar/ resonance (2)	W-C 1 3
Week 4		Ultrasonic sensor (1)	Understanding Ultrasonic sensor (1)	W-C 1 3
Week 5		Ultrasonic sensor (2)	Understanding Ultrasonic sensor (2)	W-C 1 3
Week 6		Resistance and Material	Understanding Resistance and Material	W-C 1 1 W-C 1 2
Week 7		Internal resistance and Maximum power transfer	Understanding Internal resistance and Maximum power transfer	W-C 1 1 W-C 1 2
Week 8		Writing Reports	Understanding Writing Reports	
Week 9		midterm		
Week 10		Switch and touch sensors	Understanding Switch and touch sensors	W-C 1 3 W-C 1 3
Week 11		Digital Logic gate(1)	Understanding Digital Logic gate	W-C 1 14 W-C 1 15
Week 12		Digital Logic gate(2)	Understanding Digital Logic gate	W-C 1 14 W-C 1 15
Week 13		Digital Logic gate(Adder and Subtractor)	Understanding Digital Logic gate(Adder and Subtractor)	W-C 1 14 W-C 1 15
Week 14		3D printer(introduce software)	Understanding the use of Autodesk Fusion 360 programs for 3D drawing	B-B 2 4 B-B 2 5
Week 15		3D printer(Printing process)	Understanding file management and printing process	B-B 2 4 B-B 2 5
Week 16		3D printer(Gear sketch up)	Understanding the use of Autodesk Fusion 360 programs for gear design	B-B 2 4 B-B 2 5
Week 17		3D printer(Evaluation 1)	Understanding advantage and disadvantage of 3D printing	
Week 18		Writing Reports		
Week 19		Final exam		
Week 20		Reflection and Review reports	Review and summarize learning.	

Do not

	Performance	Goal	Major Rubrics between students	Report	Portfolio	Review
Basic Ability	10					
Technical Ability	10					
Interdisciplinary Ability						