

# Electrical and Electronic Measurement 1

Basic Course Information			
Course Number	01020106	Subject Category	Compulsory - IM
Class Format	Lecture	Credit Type and Number of Credits	1
Department	Mechatronics	Student Category	Year 3
Period of Study	Semester 1	Classes per Week	2
Required Materials			
Instructor	Sant Teawcham		

**Course Objective**  
 The course provides students with introduction and basic knowledge of electrical and electronic measurements including basis of measurement, system of measurement and its standard, measurement of voltage and current, measurement of electric resistance and impedance.

Evaluation/Rubric	Ideal Level of Achievement (Very Good)	Standard Level of Achievement (Good)	Unacceptable Level of Achievement (Fail)
Operating Principle of the Basic Indicators	Demonstrates very good knowledge of Operating Principle of the Basic Indicators	Demonstrates good knowledge of Operating Principle of the Basic Indicators	Lacks the appropriate knowledge of Operating Principle of the Basic Indicators
Current and Voltage Measurements	Demonstrates very good knowledge of Current and Voltage Measurements	Demonstrates good knowledge of Current and Voltage Measurements	Lacks the appropriate knowledge of Current and Voltage Measurements
Resistance and Impedance Measurements	Demonstrates very good knowledge of Resistance and Impedance Measurements	Demonstrates good knowledge of Resistance and Impedance Measurements	Lacks the appropriate knowledge of Resistance and Impedance Measurements

**Relationship with Learning Outcomes**  
**M(1) Ability to design, propose and develop robotics/ mechatronic systems to solve specific problems**  
**M(2) Ability to design, propose and develop electrical and electronic systems for robotics/ mechatronic systems**  
**Please change**

Teaching Method	
Outline	Repeat of Explanation/ Drill
Class Format	Lecture and Drill
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		SI Units and Prefixes	Explaining SI Units and Prefixes	V-C B 80
week 2		Measurement Errors, Accuracy and Precision	Explaining Measurement Errors, Accuracy and Precision	V-C B 81
week 3		Significant Figures	Explaining Significant Figures	V-C B 82
week 4		Calculation with Significant Figures	Explaining Calculation with Significant Figures	V-C B 83
week 5		Absolute and Secondary Instruments	Explaining Absolute and Secondary Instruments	V-C B 84
week 6		Moving-Iron Ammeters and Voltmeters	Explaining Moving-Iron Ammeters and Voltmeters	V-C B 85
week 7		Moving-Coil Instruments, Hot-Wire Type Instruments	Explaining Moving-Coil Instruments, Hot-Wire Type Instruments	
week 8		Review before Midterm Examination	Explaining Review before Midterm Examination	
week 9		Midterm examination		
week 10		Return Exam Papers and Feedback	Explaining Return Exam Papers and Feedback	
week 11		Induction Type Instruments, Wattmeters	Explaining Induction Type Instruments, Wattmeters	V-C B 90
week 12		Ohmmeter Method (1)	Explaining Ohmmeter Method (1)	V-C B 86
week 13		Ohmmeter Method (2)	Explaining Ohmmeter Method (2)	V-C B 85
week 14		Voltmeter-Ammeter Method (1)	Explaining Voltmeter-Ammeter Method (1)	V-C B 84
week 15		Voltmeter-Ammeter Method (2); Substitution Method	Explaining Voltmeter-Ammeter Method (2); Substitution Method	V-C B 84
week 16		Wheatstone Bridge (1)	Explaining Wheatstone Bridge (1)	V-C B 88
week 17		Wheatstone Bridge (2)	Explaining Wheatstone Bridge (2)	V-C B 88
week 18		Review before Final Examination	Explaining Review before Final Examination	
week 19		Final examination	for week 11-18	
week 20		Return Exam Papers and Feedback, and Social Sessions		

Do not

	Examination	Quiz	Midst Evaluation Midterm system	Report	Portfolio	Other
Basic Ability						
Technical Ability						
Electronics Ability						