

# Engineering Program

<b>Specialization</b>	<b>Technology of remote industrial sensing and controlling</b>
<b>Course Number</b>	20413252
<b>Course Title</b>	<b>Actuators Lab</b>
<b>Credit Hours</b>	<b>3</b>
<b>Theoretical Hours</b>	<b>0</b>
<b>Practical Hours</b>	<b>1</b>

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**Brief Course Description:**

This covers experimental study and investigation of various types of actuators and their applications in industry.

**Course Objectives:**

Upon the completion of this course, the student will be able to:

1. Study and assemble circuits related with various types of actuators
2. Operate and test various types of actuator circuits
3. Distinguish between electrical, pneumatic and hydraulic actuators
4. Simulate actuators using special purpose simulation software

**Detailed Course Description:**

Chapter No.	Content title	Unit content	Time Needed
1	Experiment 1: Simulation of electrical actuators -	- DC motor circuit design - AC motor circuit design - Utilizing Relays and solenoids	2
2	Experiment 2: Simulation of Drive system for electrical actuators	- DC motor driving - AC motor driving	2
3	Experiment 3: Pneumatic and Electro- pneumatic actuators	Assembly and operate Pneumatic and Electro- pneumatic actuator circuits	1
4	Experiment 4: Electro-hydraulic actuators	Assembly and operate Electro-hydraulic actuators	1
5	Experiment 5: Single phase induction motors split phase type		3
6	Experiment 6 Experiments on DC motors ;shunt, series, compound		3
7	Experiment 7 Experiments on three phase induction motors; wound rotor type and squirrel		2
8	Experiment 8: Stepper motor	- Working with DC motors - Design a simple drive system for stepper motor	2

**Evaluation Strategies:**

		Percentage	Date
<b>1. Exams</b>	<b>Mid Exam</b>	20%	/ /20__
	<b>Lab activates and reports</b>	30%	/ /20__
	<b>Final Exam</b>	50%	/ /20__
<b>Total</b>		100%	

**Teaching Methodology:**

- Working with datasheet
- Practical experimental work in small groups
- PowerPoint slides
- Term projects

**Text Books & References:**

**Textbooks**

1. Labartory sheet prepared by instructor
2. Pneumatics, Basic level, Peter Croser, Frank Ebel
3. Hydraulics Basic Level, Workbook TP 50
4. Electro-hydraulics Basic level D. Merkle • K. Rupp • D. Scholz

**References**

1. Manuals of each type of machines.
3. Electric machinery fundamentals, Stephen J.Chapman, 1996.