



National Institute of Technology Meghalaya
An Institute of National Importance

CURRICULUM

Programme	Master of Technology in Mechanical Engineering	Year of Regulation				2018			
Department	Mechanical Engineering	Semester				II			
Course Code	Course Name	Credit Structure				Marks Distribution			
		L	T	P	C	INT	MID	END	Total
ME 510	Electrohydraulic System and Control	3	0	0	3	50	50	100	200
Course Objectives	To introduce electrohydraulic system and its components	Course Outcomes	CO1	Able to acquire knowledge about hydraulic system component and its application					
	To give understanding of electrohydraulic system component construction and operation		CO2	Able to acquire knowledge hydraulic system components construction and its operation.					
	To develop an ability and skill to design electrohydraulic circuit		CO3	Able to design hydraulic circuit with real life application.					
			CO4	Able to analyse hydraulic circuit					
			CO5	Able to apply concept of control theory for hydraulic circuit control.					

SYLLABUS

No.	Content	Hours	COs
I	Hydraulic System: Introduction to hydraulic system, hydraulic system component, application of the hydraulic system and advantages over other system.	05	CO1
II	Electrohydraulic system: Electrohydraulic system components, comparison with the hydraulic system, components of electrical signal control, sensors for displacement, pressure, temperature, flow measurement. Hydraulic system accessories: Hydraulic oil, reservoir, pipelines, fittings, high pressure filter, low pressure filter.	10	CO1
III	Hydraulic Cylinder: Hydraulic cylinder operational feature, classification of hydraulic cylinder, cylinder mountings, cylinder force, velocity and power, cylinder cushions. Hydraulic Pumps & Motors: Hydraulic pump operation, Pump classification, Pump noise, Pump selection. Hydraulic motors classification, principle of operation, Motor performance. Hydraulic Valves: Classification of the hydraulic valves, Principle of operation and its applications.	08	CO1 CO2
IV	Hydraulic Circuit Design and Analysis: Application of the different hydraulic circuit, Regenerative circuit. Pump unloading circuit, Double pump Hydraulic system, Counter balance valve application. Hydraulic cylinder sequence circuit, Automatic cylinder reciprocating system, Locked cylinder system.	05	CO3 CO4
V	Electrohydraulic system Control: Programmable Logic Controllers (PLCs) - introduction, block diagram, PLC operations, Linearization, open loop control, closed loop control, Transfer function, state space representation, pole placement control.	08	CO5
Total Hours		36	

Essential Readings

11. Fluid Power with Applications, Anthony Esposito, Pearson Education, Second Edition, 2013.
12. Modern Control Engineering, K Ogata, Prentice Hall, third edition, 2015

Supplementary Readings

22. Fluid Power Engineering, M Galal Rabie, McGraw Hill, First Edition, 2009
23. Hydraulic Control Systems, Merrit HE, Willwy, First Edition, 1967