



Sample Brief Course Description

Course title	Hydraulic and Pneumatic systems
Course code	ECE 435
College	Engineering
Department / Program	Engineering / Renewable Energy Engineering
Year/ Level	5/9
Course Type	A. <input type="checkbox"/> University <input type="checkbox"/> College <input checked="" type="checkbox"/> Department <input type="checkbox"/> Others b. <input checked="" type="checkbox"/> Required <input type="checkbox"/> Elective
Credited Hours	3
Contact Hours	(LT:3, LB:0 ,TR:0)
Pre-requisites (if any)	PHYS 216 PHYS 243
Co-requisites (if any)	---
Course description	Introduction to fluid power. Physical properties of hydraulic fluids. Energy & Power in Hydraulic systems. Frictional losses in hydraulic pipelines. Hydraulic pumps. Hydraulic cylinders and cushioning devices. Hydraulic motors and hydraulic valves Hydraulic circuit design and analysis. Pneumatics: air preparation and components. Pneumatics circuits and applications. Basic electrical controls for fluid power circuits



	Fluid logic control systems. Advanced electrical controls for fluid power systems.
Course Main Objectives	<p>1-Providing students with a theoretical framework as well as practical knowledge of Hydraulic and Pneumatic systems that is applicable in the most of energy systems.</p> <p>2-Understanding the Principles of operation, mathematical models, design criteria, performance characteristics, operation, and maintenance of fluid power systems.</p> <p>3-Studing advantages and limitations of Hydraulic and Pneumatic systems , the prevailing industrial standards, the graphic symbols used for circuit representation, and performance of standard fluid power components such as pumps, hydraulic motors, valves, cylinders, etc.</p> <p>4-being familiar with the actual components and fluid power circuits found in renewable energy applications.</p>
Learning Outcomes	<p>Knowledge and Understanding</p> <p>1.1 Identify the different flow processes in power generation industries by applying the governing equations.</p> <p>1.2. Differentiate between different common hydraulic and pneumatic components (pumps, actuators, motors, valves, etc.), their uses, symbols, and their performance characteristics.</p>
	<p>Skills:</p> <p>2.1. Applying mathematics, science, and engineering on fluid power systems.</p> <p>2.2. Using techniques, skills, and modern engineering tools necessary for engineering practice.</p> <p>2.3. Design hydraulic and pneumatic circuit to perform predetermined function.</p>
	<p>Values:---</p>
References	Anthony Esposito , "Fluid Power with Applications"; 7th Edition, 2008