

## Laboratory 4: Design of an Electromechanical System.

Many systems combine electrical and mechanical components into a single product. Building on our first three laboratories we will develop a mechanical switch to trigger an electrical system.

In Laboratory 2 you designed a new automatic fan control unit for your Uncle Lou. You now need to develop a mechanical power switch for your entire system. Using a cantilevered beam system similar to what you designed in Laboratory 3, design and fabricate a system that deflects 1/8 inch due to an applied load of 1 kg.

In Laboratory 3 you estimated the Modulus of Elasticity (E). Using this result, design a composite beam that results in the appropriate deflection. At each step, an instructor will sign off on your results.

Instructor's Initials	Milestones
	1. What Modulus of Elasticity did you estimate? _____psi
	2. What Area Moment of Inertia are you trying to achieve? _____in <sup>4</sup> What length are you using? _____ in
	3. Sketch your composite beam section and what is the calculated Area Moment of Inertia? _____ in <sup>4</sup>
	4. Draw your logic circuit.

Instructor's Initials	Milestones
	5. Build your composite beam and connect its wires.
	6. Build your logic circuit.
	7. Connect your switch to the logic circuit, apply the weight to close the circuit. Demonstrate that with the next lighter weight that the circuit remains open.
	8. If you were designing this electromechanical system again but your team could select the materials, what would you do different?