

Spring 2024

Course Code: MCT 313

Automation – Major Task

## Phase 1

### Task Description:

In groups of 3 students each, you are required to:

- (a) Use SIMATIC S7-1200 PLC or PLCSIM to control one of the following industrial systems:
  - a. An Industrial liquid-level system
  - b. An industrial mechatronic single axis servo system using a cascaded PID control system.
- (b) Design and tune the controllers using the PID\_Compact block in TIA Portal
- (c) You may use Factory IO/MATLAB Simulink for simulating the plants and SIL/HIL simulation.
- (d) A suitable HMI interface on TIA portal to monitor and visualize the systems' states readings as well as the desired set-points and system faults
- (e) Utilize field-related alarms for the detection of hardware and sequence faults.

### Deliverables:

1. Software TIA portal code
2. HMI interface on TIA portal
3. SIL/HIL simulation of the entire control system while the PLC/PLCSIM is running the plants' controllers
4. A technical report of the task highlighting your results and discussing your developed system performance. The report shall include the contribution of each team member in performing all task activities in a tabular form.



Liquid Level System in Factory I/O