

| S. No. | Course Code | Course Name                       | Course Type | Cd | L | T | P | Marks     |            |       |
|--------|-------------|-----------------------------------|-------------|----|---|---|---|-----------|------------|-------|
|        |             |                                   |             |    |   |   |   | Sessional | Final Exam | Total |
| 7      | ECE-413     | Automation with PLC and SCADA Lab | PCC         | 2  | 0 | 0 | 4 | 50        | -          | 50    |

**Course Outcomes:**

|  |   |
|--|---|
| At the end of the course the student will be able to : |   |
| CO1  | Demonstrate skill and knowledge of PLC system                           |
| CO2  | Demonstrate the hardware and software functioning of PLC                |
| CO3  | Apply the programming knowledge of PLC                                  |
| CO4  | Apply a combination of hardware and software to implement applications. |
| CO5  | Design and create real time applications using PLC.                     |

**List of Experiment of PLC and SCADA Lab**

| S. No.               | Experiments   |
|----------------------|---|
| 1                    | Introduction to Hardware modules and components of PLCs (iQR series)  |
| 2                    | Wiring and connections with PLC (iQR series)                          |
| 3                    | Programming of PLCs using GXWork3                                     |
| 4                    | Implementation of Timer operation on GXWorks3                         |
| 5                    | Implementation of Cascaded Timers operation on GXWorks3               |
| 6                    | Implementation of Counter operation on GXWorks3                       |
| 7                    | Implementation of Cascaded Counter operation on GXWorks3              |
| 8                    | Implementation of Cascaded timer and Counter operation on GXWorks3    |
| 9                    | Sequential operation of ON/OFF of a set of lights.                    |
| 10                   | Implementations of basic boolean logic operations using PLC           |
| 11                   | Demonstrate the functionality of different type of switches using PLC |
| 12                   | Speed control of servo motor using PLC                                |
| 13                   | Water level controlling using PLC                                     |
| 14                   | Implementation of PID Controller                                      |
| 15                   | Smart Power Monitoring using PLC                                      |
| 16                   | Characterize the robotic arm using PLC                                |
| 17                   | Demonstrate the functionality of IoT with PLC                         |
| <b>Mini Projects</b> |   |
| 1                    | Pick and place of an object using robotic arm                         |
| 2                    | Smart Traffic Control using PLC                                       |
| 3                    | Water bottle filling using conveyor belt                              |
| 4                    | Monitoring & Control of E-Appliances at home using PLC                |
| 5                    | PLC based auto door control system                                    |