GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY

## Department of Electrical & Electronics Engineering

**Course Title: PROGRAMMABLE LOGIC CONTROLLERS LAB**

**Following documents are available in Course File.**

| S.No. | Points | Yes | No |
|---|---|---|---|
| 1 | Institute and Department Vision and Mission Statements | **Y** | |
| 2 | PEO & PO Mapping | **Y** | |
| 3 | Academic Calendar | **Y** | |
| 4 | Subject Allocation Sheet | **Y** | |
| 5 | Class Time Table, Individual Timetable (Single Sheet) | **Y** | |
| 6 | Syllabus Copy | **Y** | |
| 7 | Course Handout | | **N** |
| 8 | CO-PO Mapping | **Y** | |
| 9 | CO-Cognitive Level Mapping | **Y** | |
| 10 | Lecture Notes | | **N** |
| 11 | Tutorial Sheets With Solution | | **N** |
| 12 | Soft Copy of Notes/PPT/Slides | **Y** | |
| 13 | Sessional Question Paper and Scheme of Evaluation | **Y** | |
| 14 | Best, Average and Weak Answer Scripts for Each Sessional Exam. (Photocopies) | | **N** |
| 15 | Assignment Questions and Solutions | | **N** |
| 16 | Previous University Question Papers | | **N** |
| 17 | Result Analysis | **Y** | |
| 18 | Feedback From Students | **Y** | |
| 19 | Course Exit Survey | | **N** |
| 20 | CO Attainment for All Mids. | | **N** |
| 21 | Remedial Action. | | **N** |

**Course Instructor / Course Coordinator**

**(Name)**

**Course Instructor / Course Coordinator**

**(Signature)**

**Vision of the Institute**

To be among the best of the institutions for engineers and technologists with attitudes, skills and knowledge and to become an epicenter of creative solutions.

**Mission of the Institute**

To achieve and impart quality education with an emphasis on practical skills and social relevance.

**Vision of the Department**

To impart technical knowledge and skills required to succeed in life, career and help society to achieve self-sufficiency.

**Mission of the Department**

- To become an internationally leading department for higher learning.
- To build upon the culture and values of universal science and contemporary education.
- To be a center of research and education generating knowledge and technologies which lay groundwork in shaping the future in the fields of electrical and electronics engineering.
- To develop partnership with industrial, R&D and government agencies and actively participate in conferences, technical and community activities.

## Program Educational Objectives (B.Tech-EEE)

**This programme is meant to prepare our students to professionally thrive and to lead. During their progression:**

**PEO 1:** Graduates will have a successful technical or professional careers, including supportive and leadership roles on multidisciplinary teams.

**PEO 2:** Graduates will be able to acquire, use and develop skills as required for effective professional practices.

**PEO 3:** Graduates will be able to attain holistic education that is an essential prerequisite for being a responsible member of society.

**PEO 4:** Graduates will be engaged in life-long learning, to remain abreast in their profession and be leaders in our technologically vibrant society.

## Program Outcomes (B.Tech-EEE)

a. Ability to apply knowledge of mathematics, science, and engineering.
b. Ability to design and conduct experiments, as well as to analyze and interpret data.
c. Ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability.
d. Ability to function on multi-disciplinary teams.
e. Ability to identify, formulates, and solves engineering problems.
f. Understanding of professional and ethical responsibility.
g. Ability to communicate effectively.
h. Broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context.
i. Recognition of the need for, and an ability to engage in life-long learning.
j. Knowledge of contemporary issues.
k. Ability to utilize experimental, statistical and computational methods and tools necessary for engineering practice.
l. Graduates will demonstrate an ability to design electrical and electronic circuits, power electronics, power systems; electrical machines analyze and interpret data and also an ability to design digital and analog systems and programming them.

# PROGRAMMABLE LOGIC CONTROLLERS LAB

**Course Code: GR15A4038**

## COURSE EDUCATIONAL OBJECTIVES

The knowledge gained by the students in this course:

1. To provide students with hands on different PLCs and their usage in control of drives.
2. To familiarize students with programming in PLCs.
3. To implement ladder diagrams for practical applications.
4. To analyze analog PLC operations.
5. To learn interfacing PLC with other technologies like SCADA, HMI, etc.
6. To develop different applications in PLC in control systems.
7. To learn different modes of PLC programming.

## COURSE OUTCOMES

At the end of the course student will have ability to:

1. Perform different types of PLC programming schemes.
2. Ability to implement ladder diagrams for process control.
3. To control the robots using PLC.
4. Ability to tune the PLC for different applications.
5. Relate PLCs with drives in achieving required control.
6. Extend knowledge of PLC in analog operations.
7. Interface PLC with other technologies like SCADA, HMI, etc.

## ASSESSMENT METHODS

1. Regular attendance to classes.
2. Written tests clearly linked to learning objectives
3. Classroom assessment techniques like tutorial sheets and assignments.
4. Seminars.

# Program Educational Objectives (PEOs)-Program Outcomes (POs) Relationship Matrix

(Indicate the relationships by mark "X")

| P-Outcomes<br>PEOs | a | b | c | d | e | f | g | h | i | j | k | l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | X | X | X | X | X | | | X | X | X | X | X |
| 2 | X | X | X | X | X | | | X | X | X | X | X |
| 3 | | X | X | X | | X | X | X | X | X | | |
| 4 | | | | X | | | | | X | X | | X |

| S.No | Exp No | Date | Topic |
|---|---|---|---|
| 1 | | | Introduction to Programmable Logic Controller, description of inputs and outputs completed. |
| 2 | | | Introduction to software used for PLC Programming. |
| 3 | 1 | | Programming for Different Application of Push Buttons |
| 4 | | | Hardware Implementation for different application of push buttons |
| 5 | 2 | | Programming for working of different types of Timers |
| 6 | | | Hardware Implementation for working of different types of Timers |
| 7 | 3 | | Programming for working of different types of Counters |
| 8 | | | Hardware Implementation for working of different types of Counters |
| 9 | 4 | | Programming for sequential operation of ON/OFF of a set of Lights. |
| 10 | | | Hardware Implementation for sequential operation of ON/OFF of a set of Lights. |
| 11 | 5 | | Programming for Lactching and Unlatching of a Motor |
| 12 | | | Hardware Implementation for Lactching and Unlatching of a Motor |
| 13 | | | Observations and Record Correction and Viva on completed Experiments |
| 14 | 6 | | Programming for Automatic Indication of watertank level |
| 15 | | | Hardware Implementation for Automatic Indication of watertank level |
| 16 | 7 | | Programming for Traffic Lights Indication. |
| 17 | | | Hardware Implementation for Traffic Lights Indication. |
| 18 | 8 | | Different Logic Gates programming |
| 19 | | | Hardware Implementation for Different Logic Gates |
| 20 | 9 | | Programming for Lactching and Unlatching |
| 21 | | | Hardware Implementation for Lactching and Unlatching |
| 22 | 10 | | Programming for Interlocking |
| 23 | | | Hardware Implementation for Interlocking |
| 24 | 11 | | Programming for Forward and Reverse direction control of Motors |
| 25 | | | Hardware Implementation for Forward and Reverse direction control of Motors |
| 26 | | | Observations and Record Correction and Viva on completed Experiments |
| 27 | | | Revision of all the experiments |

# Gokaraju Rangaraju Institute of Engineering and Technology
## (Autonomous)
**Bachupally, Kukatpally, Hyderabad – 500 090, India.**

GRIET/DAA/1H/G/18-19 05 May 2018

# ACADEMIC CALENDAR
## Academic Year 2018-19

### III & IV B.TECH – FIRST SEMESTER

| S. No. | EVENT | PERIOD | DURATION |
|---|---|---|---|
| 1 | 1st Spell of Instructions | 02-07-2018 to 01-09-2018 | 9 Weeks |
| 2 | 1st Mid-term Examinations | 03-09-2018 to 05-09-2018 | 3 Days |
| 3 | 2nd Spell of Instructions | 06-09-2018 to 24-10-2018 | 7 Weeks |
| 4 | 2nd Mid-term Examinations | 25-10-2018 to 27-10-2018 | 3 Days |
| 5 | Preparation | 29-10-2018 to 06-11-2018 | 1 Week 3 Days |
| 6 | **End Semester Examinations (Theory/ Practicals) Regular/Supplementary** | **08-11-2018 to 08-12-2018** | **4 Weeks 3 Days** |
| 7 | Commencement of Second Semester, A.Y 2018-19 | 10-12-2018 | |

### III & IV B.TECH – SECOND SEMESTER

| S. No. | EVENT | PERIOD | DURATION |
|---|---|---|---|
| 1 | 1st Spell of Instruction | 10-12-2018 to 02-02-2019 | 8 Weeks |
| 2 | 1st Mid-term Examinations | 04-02-2019 to 06-02-2019 | 3 Days |
| 3 | 2nd Spell of Instruction | 07-02-2019 to 06-04-2019 | **8 Weeks 3 Days** |
| 4 | 2nd Mid-term Examinations | 08-04-2019 to 10-04-2019 | 3 Days |
| 5 | Preparation | 11-04-2019 to 17-04-2019 | 1 Week |
| 6 | **End Semester Examinations (Theory/ Practicals) Regular** | 18-04-2019 to 08-05-2019 | 3 Weeks |
| 7 | **Supplementary and Summer Vacation** | **09-05-2019 to 22-06-2019** | **6 Weeks 3 Days** |
| 8 | Commencement of First Semester, A.Y 2019-20 | 24-06-2019 | |

Copy to Director, Principal, Vice Principal, DOA, DOE, Balaji Kumar, DCGC, All HODs

(Dr. K. Anuradha)
Dean of Academic Affairs

# GOKARAJU RANGARAJU
## INSTITUTE OF ENGINEERING AND TECHNOLOGY
### Department of Electrical and Electronics Engineering

## 2018-19 II-Sem Subject Allocation sheet

**GRIET/EEE/05B/G/18-19** **30.10.18**

| **II YEAR(GR17)** | Section-A | Section-B |
|---|---|---|
| Managerial Economics and Financial Analysis | | |
| Power Generation and Distrubution | SN | SN |
| AC Machines | VVSM | VVSM |
| Control Systems | Dr DGP | MS |
| Princeples of Digital Electronics | PRK | PRK |
| AC Machines Lab | PPK/DSR | PPK/DSR |
| Control Systems Lab | MS/PSVD | MS/PSVD |
| Analog and Digital Electronics Lab | RAK/DKK | RAK/DKK |
| Value Education and Ethics | | |
| Gender Sensitization Lab | MS/PSVD | MS/PSVD |
| **III YEAR (GR15)** | | |
| Computer Methods in Power systems | VVRR/MP | VVRR/MP |
| Switch Gear & Protection | PSVD | Dr JSD |
| Management Science | | |
| Utilization of Electrical Energy | MRE | MRE |
| Non Conventional Sources of Energy | | |
| Neural and Fuzzy Systems | | |
| Sensors & Transducers | UVL | UVL |
| Power Systems Lab | GSR/YSV | GSR/YSV |
| Advanced English Communications Skills Lab | | |
| Industry Oriented Mini Project Lab | PPK/AVK/Dr JP | MP/Dr JP |
| **IV YEAR (GR15)** | | |
| Programmable Logic Controllers | PK | |
| Flexible AC Transmission Systems | Dr TSK | |
| EHV AC Transmission | | |
| Power System Automation | | |
| Modern Power Electronics | AVK | |
| DSP Based Electromechanical Systems | | |
| Advanced Control Systems | | |
| Programmable Logic Controllers-Lab | VVSM | PK |
| Main Projects | RAK/Dr SVJK | PK/VVRR |
| **M.Tech PE** | | |
| Modeling and Analysis of Electrical Machines | Dr BPB | |

| | | |
|---|---|---|
| Digital control of power Electronics and Drive Systems | Dr DGP | |
| FACTS and Custom power Devices | Dr TSK | |
| Smart Grids | VVRR | |
| Audit Course -2 | | |
| Power Quality Lab | Dr BPB | |
| Digital Signal Processing Lab | AVK | |
| MINI Projects | Dr JP/GSR | |
| **M.Tech PS** | | |
| Digital Protection of Power System | Dr JSD | |
| Power System Dynamics -II | Dr SVJK | |
| FACTS and Custom power Devices | Dr TSK | |
| Smart Grids | VVRR | |
| Audit Course -2 | | |
| Power Quality Lab | Dr BPB | |
| Power System Protection Lab | VUR | |
| MINI Projects | Dr JP/GSR | |
| **Other Dept.** | | |
| BEE (I YEAR) CSE (6) | MNSR,MK,MVK, | |
| BEE Lab | MNSR,MK,MVK,YSV,VUR,PS,UVL,MRE,GBR | |
| EET (II YEAR) Mech (2) | KS | KS |
| EET LAB ( II TEAR) Mech (2) | KS,DKK,PPK, | |

# DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

GRIET/PRIN/06/G/01/18-19

wef: 10 Dec 2018

B.Tech - EEE - A

IV Year - II Semester

| Day/Hour | 10:00-10:50 | 10:50-11:40 | 11:40-12:30 | 12:30-1:00 | 1:00-1:30 | 1:30-2:20 | 2:20-3:10 | 3:10-4:00 |
|---|---|---|---|---|---|---|---|---|
| MONDAY | PLC Lab | | | | BREAK | FACTS | | PLC |
| TUESDAY | FACTS | | MPE | | | FACTS | | PLC |
| WEDNESDAY | MPE | | PLC | | | PROJECTS | | |
| THURSDAY | PROJECTS | | | | | PROJECTS | | |
| FRIDAY | PLC | | MPE | | | PROJECTS | | |
| SATURDAY | PROJECTS | | | | | PROJECTS | | |

| Room No. | |
|---|---|
| Theory | 4502 |
| Lab | 4510 / 4513 |

| Class Incharge: | P Praveen Kumar |
|---|---|

| Subject Code | Subject Name | Faculty Code | Faculty name | Almanac | |
|---|---|---|---|---|---|
| GR15A4030 | Programmable Logic Controllers | PK | P Prashanth Kumar | 1st Spell of Instructions | 10-12-2018 to 06-02-2019 |
| GR15A4032 | Flexible AC Transmission Systems | Dr TSK | Dr T Suresh Kumar | UMAR | 07-02-2019 to 09-02-2019 |
| GR15A4036 | Modern Power Electronics | AVK | A Vinay Kumar | 2nd Spell of Instructions | 11-02-2019 to 03-04-2019 |
| GR15A4038 | Programmable Logic Controllers-Lab | VVSM | VVS Madhuri | 2nd Mid-term Examinations | 04-04-2019 to 06-04-2019 |
| GR15A4144 | Main Projects | RAK/Dr SVJK | R Anil Kumar/ Dr S V Jayaram Kumar | Preparation | 08-04-2019 to 17-04-2019 |
| | | | | End Semester Examinations (Theory/ Practicals) Regular | 18-04-2019 to 08-05-2019 |
| | | | | Supplementary and Summer Vacation | 09-05-2019-to 22-06-2019 |
| | | | | Commencement of Second Semester , AY | 24-06-19 |

HOD

Co-ordinator

DAA

# IV_YEAR

## DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

GRIET/PRIN/06/G/01/18-19

B.Tech - EEE - B

wef: 10 Dec 2018

IV Year - II Semester

| Day/Hour | 10:00-10:50 | 10:50-11:40 | 11:40-12:30 | 12:30-1:00 | 1:00-1:30 | 1:30-2:20 | 2:20-3:10 | 3:10-4:00 |
|---|---|---|---|---|---|---|---|---|
| MONDAY | PROJECTS | | | | BREAK | FACTS | | PLC |
| TUESDAY | FACTS | | MPE | | | FACTS | | PLC |
| WEDNESDAY | MPE | | PLC | | | PROJECTS | | |
| THURSDAY | PLC Lab | | | | | PROJECTS | | |
| FRIDAY | PLC | | MPE | | | PROJECTS | | |
| SATURDAY | PROJECTS | | | | | PROJECTS | | |

| Room No. | |
|---|---|
| Theory | 4502 |
| Lab | 4510 / 4513 |

| Class Incharge: | P Praveen Kumar |
|---|---|

| Subject Code | Subject Name | Faculty Code | Faculty name |
|---|---|---|---|
| GR15A4030 | Programmable Logic Controllers | PK | P Prashanth Kumar |
| GR15A4032 | Flexible AC Transmission Systems | Dr T S K | Dr T Suresh Kumar |
| GR15A4036 | Modern Power Electronics | AVK | A Vinay Kumar |
| GR15A4038 | Programmable Logic Controllers-Lab | PK | P Prashanth Kumar |
| GR15A4144 | Main Projects | PK/VVRR | P Prashanth Kumar/ V Vijaya Rama Raju |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |

| Almanac | |
|---|---|
| 1st Spell of Instructions | 10-12-2018 to 06-02-2019 |
| 1st Mid-term Examinations | 07-02-2019 to 09-02-2019 |
| 2nd Spell of Instructions | 11-02-2019 to 03-04-2019 |
| 2nd Mid-term Examinations | 04-04-2019 to 06-04-2019 |
| Preparation | 08-04-2019 to 17-04-2019 |
| End Semester Examinations (Theory/ Practicals) Regular | 18-04-2019 to 08-05-2019 |
| Supplementary and Summer Vacation | 09-05-2019-to 22-06-2019 |
| Commencement of Second Semester , AY | 24-06-19 |

HOD

Co-ordinator

DAA

# PROGRAMMABLE LOGIC CONTROLLERS LAB

## IV Year II SEM

**Course Code: GR15A4038** **L T P C: 0 0 2 2**

## List of Experiments

**Task1:** Different applications of Push buttons.

**Task2:** Working of different types of Timers.

**Task3:** Working of different types of Counters.

**Task4:** Sequential operation of ON/OFF of a set of lights.

**Task5:** Latching and Unlatching of a Motor.

**Task6:** Automatic indication of water tank level.

**Task7**: Traffic lights indication.

**Task8:** Logic Gates

**Task9:** Interlocking

**Task10:** Forward and Reverse direction control of Motors.

- **Introduction on Millenium PLC.**
- **Introduction on Siemens PLC**

# COURSE OUTCOME AND PROGRAM OUTCOME MAPPING

| P-Outcomes<br>C-Outcomes | a | b | c | d | e | f | g | h | i | j | k | l |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | | X | | | X | X | | X | | | X | |
| 2 | X | X | | X | X | X | X | | | | | |
| 3 | X | | | X | X | | X | X | | | | X |
| 4 | X | X | X | | | | X | | | | X | X |
| 5 | X | X | X | | | | | X | | | X | |
| 6 | | X | X | | X | | X | | X | | | X |
| 7 | | X | | X | X | | | | X | | | X |

## CO – Cognitive Level Mapping

| C | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| CO-1 | X | | | | | |
| CO-2 | | X | | | | |
| CO-3 | | | X | | | |
| CO-4 | | | X | X | | |
| CO-5 | | | | X | | |
| CO-6 | X | X | X | | | |
| CO-7 | | | X | X | X | |

1-REMEMBER

2-UNDERSTAND

3-APPLY

4-ANALYSE

5-EVALUATE

6-CREATE

# GOKARAJU RANGARAJU
## INSTITUTE OF ENGINEERING AND TECHNOLOGY
### Department of Electrical and Electronics Engineering

B.Tech EEE IV YEAR-II SEM RESULT ANALYSIS OF 2015-2019 BATCH

ACADEMIC YEAR 2018-2019 TOTAL. NO. OF STUDENTS REGISTERED = 140

| Subject | Total No. of students appeared | No. of students passed | No. of students failed | Grade Points | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | <5 | 5 | 6 | 7 | 8 | 9 | 10 | Pass percentage (%) |
| PLC | 140 | 136 | 04 | 00 | 04 | 10 | 13 | 33 | 39 | 37 | 97.14 |
| FACTS | 140 | 135 | 05 | 00 | 00 | 04 | 04 | 33 | 51 | 43 | 96.42 |
| MPE | 140 | 136 | 04 | 05 | 19 | 17 | 18 | 35 | 31 | 11 | 97.14 |
| PLC Lab | 140 | 140 | 00 | 00 | 00 | 00 | 00 | 07 | 21 | 112 | 100 |
| CV | 140 | 140 | 00 | 00 | 00 | 04 | 04 | 05 | 08 | 119 | 100 |
| SEM | 140 | 140 | 00 | 00 | 00 | 00 | 00 | 13 | 49 | 78 | 100 |
| Major Proj. | 140 | 140 | 00 | 00 | 00 | 00 | 00 | 00 | 00 | 140 | 100 |

Overall pass (passed in all subjects) = 133/ 140(95%)

Faculty

| | |
|---|---|
| Programmable Logic Controllers | P Prashanth Kumar |
| Flexible AC Transmission Systems | Dr T Suresh Kumar |
| Modern Power Electronics | A Vinay Kumar |
| Programmable Logic Controllers Lab | VVSMadhuri/P Prashanth Kumar |
| Comprehensive Viva | Dr S V Jayaram Kumar/V Vijaya Rama Raju/ R Anil Kumar/P Prashanth Kumar |
| Seminar | Dr S V Jayaram Kumar/V Vijaya Rama Raju/ R Anil Kumar/P Prashanth Kumar |
| Major Project | Dr S V Jayaram Kumar/V Vijaya Rama Raju/ R Anil Kumar/P Prashanth Kumar |

ARREARS POSITION – CURRENT YEAR

| Description | All pass | One Arrear | Two Arrear | Three Arrears | More than Three Arrears | % of pass |
|---|---|---|---|---|---|---|
| 140 | 133 | 03 | 02 | 02 | 00 | 95% |

**Performance overall Class Three Toppers**

| ROLL NO. | NAME | (SGPA) |
|---|---|---|
| 15241A0205<br>15241A0267<br>15241A0282<br>15241A0292<br>15241A02B3 | **Chamakura Apoorva Reddy**<br>**Bathula Sreelekha**<br>**K Supraja Goud**<br>**Koya Madhuri**<br>**Rachuri Sai Teja** | **10** |
| 15241A0284<br>15241A0285<br>15241A02B6 | Kalakuntla Divya<br>Kalluri Srilatha<br>Songani Keerthi | **9.96** |
| 15241A02B7 | **Thanda Shashank** | **9.92** |

HOD, EEE

## Gokaraju Rangaraju Institute of Engineering & Technology

Electrical and Electronics Engineering

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### Feedback Report

**FeedBack No** : 3

**Branch** : Electrical and Electronics Engineering

**Academic Year** : 2018-19

**Year & Semester** : Fourth Year, Second Semester

**Subject Name** : Programmable Logic Controllers Lab **Faculty Name** : P. Prasanth Kumar

**Subject Code** : GR15A4038 **Section** : B

| S.No | Question | Average |
|---|---|---|
| 1 | How does the teacher explain the subject? | 3.36 |
| 2 | How do you find the language and communication skill of the teacher? | 3.41 |
| 3 | Rate your teacher's regularity / punctuality to the class | 3.33 |
| 4 | Rate your teacher's explanation in clearing the doubts | 3.36 |
| 5 | Rate your teacher's commitment in completing the syllabus | 3.38 |
| 6 | Does the teacher pays attention to all the students? | 3.48 |
| 7 | Rate your teachers use of teaching aids | 3.30 |
| 8 | Is the session interactive? | 3.36 |
| 9 | Rate your teacher's guidence in other activities like Moodle, NPTEL etc | 3.41 |
| 10 | What is the overall opinion about the teacher? | 3.32 |

No of Students given feedback : 69

**Overall average : 3.37**

**Signature of Faculty** **Signature of HOD** **Signature of Principal**