COURSE OBJECTIVES

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I

Section: A

Course/Subject: Programmable Logic Controllers & their applications

Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..

Dept.: E.E.E

Designation : HOD.

On completion of this Subject/Course the student shall be able to:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Objectives</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>To provide knowledge levels needed for PLC programming and operating.</td>
</tr>
<tr>
<td>2</td>
<td>To make the students how devices to which PLC input and output modules are connected</td>
</tr>
<tr>
<td>3</td>
<td>To train the students to create ladder diagrams from process control descriptions.</td>
</tr>
<tr>
<td>4</td>
<td>To make the students understand various types of PLC registers</td>
</tr>
<tr>
<td>5</td>
<td>Apply PLC Timers and Counters for the control of industrial processes</td>
</tr>
<tr>
<td>6</td>
<td>To make the students understand PLC functions, Data Handling Function</td>
</tr>
<tr>
<td>7</td>
<td>To train the students to develop a “coil and contact” control system to operate a basic robot and analog PLC operations.</td>
</tr>
</tbody>
</table>

Signature of HOD

Signature of faculty

Date:

Date:

Note: Please refer to Bloom’s Taxonomy, to know the illustrative verbs that can be used to state the objectives.
### COURSE OUTCOMES

**Academic Year**: 2012-2013  
**Semester**: I  
**Name of the Program**: M.Tech …P.E… Year: I  
**Course/Subject**: Programmable Logic Controllers & their applications  
**Code**: GR11D5057  
**Name of the Faculty**: …………M.Chakravarthy……………..  
**Dept.**: E.E.E  
**Designation**: HOD.

The expected outcomes of the Course/Subject are:

<table>
<thead>
<tr>
<th>S.No</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ability to gain knowledge on Programmable Logic Controllers</td>
</tr>
<tr>
<td>2</td>
<td>Will understand different types of Devices to which PLC input and output modules are connected</td>
</tr>
<tr>
<td>3</td>
<td>To provide the knowledge about understand various types of PLC registers</td>
</tr>
<tr>
<td>4</td>
<td>Able to create ladder diagrams from process control descriptions.</td>
</tr>
<tr>
<td>5</td>
<td>Ability to apply PLC timers and counters for the control of industrial processes</td>
</tr>
<tr>
<td>6</td>
<td>Able to use different types PLC functions, Data Handling Function.</td>
</tr>
<tr>
<td>7</td>
<td>Able to develop a “coil and contact” control system to operate a basic robot and analog PLC operations.</td>
</tr>
</tbody>
</table>

Signature of HOD:  
Signature of faculty:  
Date:  
Date:  

Note: Please refer to Bloom’s Taxonomy, to know the illustrative verbs that can be used to state the outcomes.
MISSION OF THE INSTITUTE:
To be among the best of the institutions for engineers and technologists with attitudes, skill and knowledge and to become an epicenter of creative solutions.

VISION OF THE INSTITUTE:
To achieve and impart quality education with an emphasis on practical skills and social relevance.

MISSION OF THE PROGRAM:
To provide the technical knowledge and soft skills required to succeed in life, career and help society to achieve self-sufficiency.

Program Educational Objectives:
This education is meant to prepare our students to thrive and to lead. In their careers, our graduates:

1. Will have successful technical or professional careers, including supportive and leadership roles on multidisciplinary teams.

2. Will acquire, use and develop skills required for effective professional practices.

3. Will acquire the holistic education necessary to be a responsible member of society.

4. Engage in life-long learning to remain current in their profession and be leaders in our technological society.

Program Learning Outcomes:
Students in the Electronics and Communication Engineering program should, at the time of their graduation, be in possession of:

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.

**Name of the Course: PROGRAMMABLE LOGIC CONTROLLERS**

**Course educational objectives:**
1. To provide knowledge levels needed for PLC programming and operating.
2. To make the students how devices to which PLC input and output modules are connected.
3. To train the students to create ladder diagrams from process control descriptions.
4. To make the students understand various types of PLC registers.
5. Apply PLC Timers and Counters for the control of industrial processes.
6. To make the students understand PLC functions, Data Handling Function.
7. To train the students to develop a “coil and contact” control system to operate a basic robot and analog PLC operations.

**Course outcomes:**
At the end of the course student will have ability to
1. Ability to gain knowledge on Programmable Logic Controllers.
2. Will understand different types of Devices to which PLC input and output modules are connected.
3. To provide the knowledge about understand various types of PLC registers.
4. Able to create ladder diagrams from process control descriptions.
5. Ability to apply PLC timers and counters for the control of industrial processes.
6. Able to use different types PLC functions, Data Handling Function.
7. Able to develop a “coil and contact” control system to operate a basic robot and analog PLC operations.

Assessment methods:

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

1. Program Educational Objectives (PEOs) – Vision/Mission Matrix (Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>Vision/Mission PEOs</th>
<th>Vision of the Institute</th>
<th>Mission of the Institute</th>
<th>Mission of the Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

2. Program Educational Objectives(PEOs)-Program Outcomes(POs) Relationship Matrix (Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>P-Outcomes</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>K</th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>

3. Course Objectives-Course Outcomes Relationship Matrix (Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>Course-outcomes</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
</tbody>
</table>
### 4. Course Objectives-Program Outcomes (POs) Relationship Matrix
(Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>P-Outcomes</th>
<th>A</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Objectives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 5. Course Outcomes-Program Outcomes (POs) Relationship Matrix
(Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>P-Outcomes</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>K</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>C-Objectives</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 6. Courses (with title & code)-Program Outcomes (POs) Relationship Matrix
(Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>P-Outcomes</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>K</th>
<th>L</th>
<th>m</th>
</tr>
</thead>
<tbody>
<tr>
<td>Courses</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROGRAMMABLE LOGIC CONTROLLERS . GR11A4096</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
7. **Program Educational Objectives (PEOs)-Course Outcomes Relationship Matrix**
(Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>P-Objectives (PEOs)</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course-Outcomes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

8. **Assignments & Assessments-Program Outcomes (POs) Relationship Matrix**
(Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>P-Outcomes Assessments</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>k</th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>X</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

9. **Assignments & Assessments-Program Educational Objectives (PEOs) Relationship Matrix**
(Indicate the relationships by mark “X”)

<table>
<thead>
<tr>
<th>PEO’s Assessments</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
10. Constituencies - Program Outcomes (POs) Relationship Matrix (Indicate the relationships by mark “X”).

1. Alumni
2. Government employers
3. Students

<table>
<thead>
<tr>
<th>P-Outcomes</th>
<th>a</th>
<th>b</th>
<th>c</th>
<th>d</th>
<th>e</th>
<th>f</th>
<th>g</th>
<th>h</th>
<th>i</th>
<th>j</th>
<th>k</th>
<th>l</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td>X X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Prepare the following Matrix:

11. The improvements Matrix are summarized below and described in the text that follows.
GUIDELINES TO STUDY THE COURSE / SUBJECT

Academic Year : 2012-2013
Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E
Designation : HOD.

Guidelines to study the Course/ Subject: Programmable Logic Controllers

Course Design and Delivery System (CDD):
• The Course syllabus is written into number of learning objectives and outcomes.
• These learning objectives and outcomes will be achieved through lectures, assessments, assignments, experiments in the laboratory, projects, seminars, presentations, etc.
• Every student will be given an assessment plan, criteria for assessment, scheme of evaluation and grading method.
• The Learning Process will be carried out through assessments of Knowledge, Skills and Attitude by various methods and the students will be given guidance to refer to the text books, reference books, journals, etc.

The faculty be able to –
• Understand the principles of Learning
• Understand the psychology of students
• Develop instructional objectives for a given topic
• Prepare course, unit and lesson plans
• Understand different methods of teaching and learning
• Use appropriate teaching and learning aids
• Plan and deliver lectures effectively
• Provide feedback to students using various methods of Assessments and tools of Evaluation
• Act as a guide, advisor, counselor, facilitator, motivator and not just as a teacher alone

Signature of HOD
Date:

Signature of faculty
Date:
COURSE SCHEDULE

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I     Section: A

Course/Subject: Programmable Logic Controllers & their applications   Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..Dept.: E.E.E

Designation : HOD.

The Schedule for the whole Course / Subject is:

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Description</th>
<th>Duration (Date)</th>
<th>Total No. Of Periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>PLC Basics PLC system, I/O modules and interfacing CPU processor programming</td>
<td>04/12/2012 to 20/12/2012</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>equipment programming formats, construction of PLC ladder diagrams, devices</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>connected to I/O modules.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>PLC Programming input instructions, outputs, operational procedures,</td>
<td>27/12/2012 to 22/01/2013</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>programming examples using contacts and coils. Drill press operation.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Digital logic gates programming in the Boolean algebra system, conversion</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>examples Ladder diagrams for process control Ladder diagrams and sequence</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>listings, ladder diagram construction and flow chart for spray process system.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>PLC Registers: Characteristics of Registers module addressing holding</td>
<td>24/01/2013 to 19/02/2013</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>registers input registers, output registers PLC Functions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Timer functions and industrial applications

Counters, counter function, industrial applications. Arithmetic functions, Number comparison functions, number conversion functions.

### Data Handling functions

SKIP, Master control, Relay Jump Move FIFO, FAL, ONS, CLR and Sweep functions and their applications. Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axis and three axis Robots with PLC, Matrix functions.

### Analog PLC operation

Analog modules and systems. Analog signal processing, multi bit data processing, analog output application examples. PID principles, position indicator with PID control, PID modules, PID tuning, PID functions.

<p>| | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4.</td>
<td>Data Handling functions: SKIP, Master control, Relay Jump Move FIFO, FAL, ONS, CLR and Sweep functions and their applications. Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axis and three axis Robots with PLC, Matrix functions.</td>
<td>21/02/2013</td>
<td>12/03/2013</td>
</tr>
<tr>
<td>5.</td>
<td>Analog PLC operation: Analog modules and systems. Analog signal processing, multi bit data processing, analog output application examples. PID principles, position indicator with PID control, PID modules, PID tuning, PID functions.</td>
<td>14/03/2013</td>
<td>04/04/2013</td>
</tr>
</tbody>
</table>

Total No. of Instructional periods available for the course: 60/60 Hours / Periods
ILLUSTRATIVE VERBS FOR STATING INSTRUCTIONAL OBJECTIVES

These verbs can also be used while framing questions for Continuous Assessment Examinations as well as for End – Semester (final)Examinations

### ILLUSTRATIVE VERBS FOR STATING GENERAL OBJECTIVES/OUTCOMES

<table>
<thead>
<tr>
<th>Know</th>
<th>Understand</th>
<th>Analyze</th>
<th>Design</th>
</tr>
</thead>
</table>

### ILLUSTRATIVE VERBS FOR STATING SPECIFIC OBJECTIVES/OUTCOMES:

**A. COGNITIVE DOMAIN (KNOWLEDGE)**

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knowledge</td>
<td>Comprehension Understanding</td>
<td>Application of knowledge &amp; comprehension</td>
<td>Analysis Of whole w.r.t. its constituents</td>
<td>Synthesis</td>
<td>Evaluation</td>
</tr>
<tr>
<td></td>
<td>Know</td>
<td>Understand</td>
<td>Apply</td>
<td>Analyze</td>
<td>Design</td>
</tr>
</tbody>
</table>

<p>| Define | Identify | Label | List | Select | State | Convert | Describe (a Procedure) | Distinguish | Differentiate | Categorize | Generate | Evaluate | Appraise | Compare | Conclude | Contrast | Justify | Generate | Plan | Rearrange | Reconstruct |
|--------|---------|-------|------|--------|-------|---------|------------------------|-------------|-------------|-----------|----------|----------|---------|---------|---------|---------|---------|---------|----------|--------|-----------|----------|</p>
<table>
<thead>
<tr>
<th>B. AFFECTIVE DOMAIN (ATTITUDE)</th>
<th>C. PSYCHOMOTOR DOMAIN (SKILLS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resolve</td>
<td>Bend</td>
</tr>
<tr>
<td>Assist</td>
<td>Calibrate</td>
</tr>
<tr>
<td>Attend</td>
<td>Conduct</td>
</tr>
<tr>
<td>Change</td>
<td>Connect</td>
</tr>
<tr>
<td>Develop</td>
<td>Convert</td>
</tr>
<tr>
<td>Help</td>
<td></td>
</tr>
<tr>
<td>Influence</td>
<td></td>
</tr>
</tbody>
</table>
## SCHEDULE OF INSTRUCTIONS

### COURSE PLAN

**Academic Year**: 2012-2013  
**Semester**: I  
**Name of the Program**: M.Tech …P.E… Year: I  
**Course/Subject**: Programmable Logic Controllers & their applications  
**Name of the Faculty**: …………M.Chakravarthy…………….  
**Designation**: HOD.  
**Code**: GR11D5057  
**Dept.**: E.E.E  

<table>
<thead>
<tr>
<th>Unit No.</th>
<th>Lesson No.</th>
<th>Date</th>
<th>No. of Periods</th>
<th>Topics / Sub-Topics</th>
<th>Objectives &amp; Outcomes Nos.</th>
<th>References (Text Book, Journal…) Page Nos.: ____to ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>1.</td>
<td>04/12/2012</td>
<td>2hrs</td>
<td>PLC System</td>
<td>1&amp;1</td>
<td>4 to 11</td>
</tr>
<tr>
<td>2.</td>
<td></td>
<td>6/12/2012</td>
<td>2hrs</td>
<td>I/O modules and interfacing</td>
<td>2&amp;2</td>
<td>15 to 20 ,32 to 34</td>
</tr>
<tr>
<td>3.</td>
<td></td>
<td>11/12/2012</td>
<td>2hrs</td>
<td>CPU Processor</td>
<td>1,2 &amp; 1,2</td>
<td>24 to 3</td>
</tr>
<tr>
<td>4.</td>
<td></td>
<td>13/12/2012</td>
<td>2hrs</td>
<td>Program equipment, Programming formats</td>
<td>1,2,3 &amp; 1,3</td>
<td>38 to 43</td>
</tr>
<tr>
<td>5.</td>
<td></td>
<td>18/12/2012</td>
<td>2hrs</td>
<td>Construction of PLC ladder diagrams</td>
<td>1,3 &amp;3</td>
<td>43 to 46</td>
</tr>
<tr>
<td>6.</td>
<td></td>
<td>20/12/2012</td>
<td>2hrs</td>
<td>Devices connected to I/O modules</td>
<td>2 &amp;2</td>
<td>54 to 74</td>
</tr>
<tr>
<td>7.</td>
<td></td>
<td>27/12/2012</td>
<td>2hrs</td>
<td>Input instructions, outputs, procedures</td>
<td>1,2 &amp; 2</td>
<td>78 to 84</td>
</tr>
<tr>
<td>8.</td>
<td></td>
<td>03/01/2013</td>
<td>2hrs</td>
<td>Programming examples using contacts and coils</td>
<td>2,3&amp;3</td>
<td>85 to 94</td>
</tr>
<tr>
<td>9.</td>
<td></td>
<td>08/01/2013</td>
<td>2hrs</td>
<td>Drill press operation, digital logic gates</td>
<td>1,2,3 &amp;1,3</td>
<td>94 to 97 102 to 106</td>
</tr>
<tr>
<td>10.</td>
<td></td>
<td>10/01/2013</td>
<td>2hrs</td>
<td>Programming in Boolean algebra, conversion examples</td>
<td>12&amp;2</td>
<td>106 to 113</td>
</tr>
<tr>
<td>11</td>
<td></td>
<td>17/01/2013</td>
<td>2hrs</td>
<td>Ladder diagrams and sequence</td>
<td>2,3&amp;3</td>
<td>118 to 122</td>
</tr>
<tr>
<td>Listings</td>
<td>Date</td>
<td>Duration</td>
<td>Description</td>
<td>Course Objective Numbers</td>
<td>Duration (HH:MM)</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------------------------------</td>
<td>---------------</td>
<td>----------</td>
<td>-------------------------------------------------------------------------------------------------</td>
<td>--------------------------</td>
<td>------------------</td>
<td></td>
</tr>
<tr>
<td>12 22/01/2013 2hrs Ladder diagram construction and flow chart for spray process system</td>
<td>2,3&amp;3</td>
<td>122 to 129</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 13 24/01/2013 2hrs characteristics of registers, module addressing</td>
<td>4 &amp; 1,4</td>
<td>134 to 135</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14 29/01/2013 2hrs Holding registers, input registers, output registers</td>
<td>4 &amp;4</td>
<td>135 to 141</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15 31/01/2013 2hrs Timer functions and industrial applications</td>
<td>5,6 &amp;5</td>
<td>144 to 164</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>16 11/02/2013 2hrs counters, counter function industrial applications</td>
<td>5,6 &amp;5</td>
<td>168 to 176</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>17 14/02/2013 2hrs Arithmetic functions</td>
<td>6&amp;6</td>
<td>182 to 195</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>18 19/02/2013 2hrs Number comparison functions, Number conversion functions</td>
<td>6&amp;6</td>
<td>198 to 211</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 19 21/02/2013 2hrs Skip, master control relay</td>
<td>6 &amp;6</td>
<td>232 to 237</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 25/02/2013 2hrs Jump, move</td>
<td>6&amp;6</td>
<td>242 to 262</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>21 28/02/2013 2hrs FIFO, FAL, ONS CLR &amp; Sweep functions and their applications</td>
<td>6&amp;6</td>
<td>266 to 270</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22 05/03/2013 2hrs Bit pattern and Changing a bit shift register</td>
<td>6&amp;6</td>
<td>274 to 288</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>23 07/03/2013 2hrs Sequence functions and applications</td>
<td>6&amp;6</td>
<td>292 to 307</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 12/03/2013 2hrs Controlling of two axis and three axes robots with plc matrix functions</td>
<td>7&amp;7</td>
<td>310 to 319</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 25 14/03/2013 2hrs Analog modules and systems</td>
<td>1,7 &amp; 7</td>
<td>338 to 340</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>26 19/03/2013 2hrs Analog signal processing,</td>
<td>7 &amp; 7</td>
<td>340 to 343</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 21/03/2013 2hrs Multi bit data processing</td>
<td>7 &amp; 7</td>
<td>343 to 344</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>28 28/03/2013 2hrs Analog output application examples</td>
<td>7 &amp; 7</td>
<td>344 to 349</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>29 02/04/2013 2hrs PID principles, position indicator with PID control</td>
<td>7 &amp; 7</td>
<td>352 to 357</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 04/04/2013 2hrs PID modules, PID tuning PID functions</td>
<td>7 &amp; 7</td>
<td>357 to 362</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Signature of HOD
Date:
Note: 1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED IN BOLD
3. MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUT COME NUMBERS AGAINST EACH TOPIC.

Signature of faculty
Date:
# COURSE COMPLETION STATUS

**Academic Year**: 2012-2013  
**Semester**: I  
**Name of the Program**: M.Tech …P.E… Year: I  
**Course/Subject**: Programmable Logic Controllers & their applications  
**Name of the Faculty**: …………M.Chakravarthy……………..  
**Dept.**: E.E.E  
**Designation**: HOD.

**Actual Date of Completion & Remarks, if any**

<table>
<thead>
<tr>
<th>Units</th>
<th>Remarks</th>
<th>No. of Objectives Achieved</th>
<th>No. of Outcomes Achieved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1</td>
<td>Completed 20/12/2012</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Unit 2</td>
<td>Completed 22/01/2013</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Unit 3</td>
<td>Completed 19/02/2013</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td>Unit 4</td>
<td>Completed 12/03/2013</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Unit 5</td>
<td>Completed 04/04/2013</td>
<td>2</td>
<td>3</td>
</tr>
</tbody>
</table>

Signature of HOD  
Signature of faculty  
Date:  
Date:  

**Note**: After the completion of each unit mention the number of Objectives & Outcomes Achieved.
SYLLABUS

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I

Section: A

Course/Subject: Programmable Logic Controllers & their applications

Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..

Dept.: E.E.E

Designation : HOD.

Unit I:
PLC Basics PLC system, I/O modules and interfacing CPU processor programming equipment programming formats, construction of PLC ladder diagrams, devices connected to I/O modules.

Unit II:
PLC Programming input instructions, outputs, operational procedures, programming examples using contacts and coils. Drill press operation.
Digital logic gates programming in the Boolean algebra system, conversion examples Ladder diagrams for process control Ladder diagrams and sequence listings, ladder diagram construction and flow chart for spray process system.

Unit III:
PLC Registers: Characteristics of Registers module addressing holding registers input registers, output registers PLC Functions Timer functions and industrial applications counters counter function industrial applications. Arithmetic functions, Number comparison functions, number conversion functions.

Unit IV:
Data handling functions: SKIP, Master control Relay Jump Move FIFO, FAL, ONS, CLR and Sweep functions and their applications.
Bit Pattern and changing a bit shift register, sequence functions and applications, controlling of two axes and three axis Robots with PLC, Matrix functions.
Unit V:
Analog PLC operation: Analog modules and systems Analog signal processing multi bit data processing, analog output application examples. PID principles position indicator with PID control, PID modules, PID tuning, PID functions

REFERENCE BOOKS
<table>
<thead>
<tr>
<th>Day</th>
<th>9:00-10:30</th>
<th>10:30-11:30</th>
<th>11:30-12:00</th>
<th>12:00-1:00</th>
<th>1:00-2:30</th>
<th>2:30-4:00</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tuesday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wednesday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thursday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturday</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Room No:**
- **Theory:** 2309
- **Lab:** 2310
- **Seminar:** 2102

**I/C:** V Vijaya Rama Raju
## SCHEDULE OF INSTRUCTIONS
### UNIT PLAN

**Academic Year**: 2012-2013  
**Semester**: I  
**Name of the Program**: M.Tech …P.E… Year: I  
**Course/Subject**: Programmable Logic Controllers & their applications  
**Name of the Faculty**: …………M.Chakravarthy…………….  
**Designation**: HOD.  
**Code**: GR11D5057  
**Dept.**: E.E.E

<table>
<thead>
<tr>
<th>Lesson No.</th>
<th>Date</th>
<th>No. of Periods</th>
<th>Topics / Sub - Topics</th>
<th>Objectives &amp; Outcomes Nos.</th>
<th>References (Text Book, Journal…)</th>
<th>Page Nos.: ____to ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>04/12/2012</td>
<td>2</td>
<td>PLC System</td>
<td>1&amp;1</td>
<td>John. w.webb ,Ronald A.Reis</td>
<td>4 to 11</td>
</tr>
<tr>
<td>2.</td>
<td>6/12/2012</td>
<td>2</td>
<td>I/O modules and interfacing</td>
<td>2&amp;2</td>
<td></td>
<td>15 to 20,32 to 34</td>
</tr>
<tr>
<td>3.</td>
<td>11/12/2012</td>
<td>2</td>
<td>CPU Processor</td>
<td>1,2 &amp; 1,2</td>
<td></td>
<td>24 to 3</td>
</tr>
<tr>
<td>4.</td>
<td>13/12/2012</td>
<td>2</td>
<td>Program equipment, Programming formats</td>
<td>1,2,3 &amp; 1,3</td>
<td></td>
<td>38 to 43</td>
</tr>
<tr>
<td>5.</td>
<td>18/12/2012</td>
<td>2</td>
<td>Construction of PLC ladder diagrams</td>
<td>1,3 &amp;3</td>
<td></td>
<td>43 to 46</td>
</tr>
<tr>
<td>6.</td>
<td>20/12/2012</td>
<td>2</td>
<td>Devices connected to I/O modules</td>
<td>2 &amp;2</td>
<td></td>
<td>54 to 74</td>
</tr>
</tbody>
</table>

**Signature of HOD**  
**Signature of faculty**

**Date:**  
**Date:**

**Note:**  
1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.  
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED IN BOLD  
3. MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUTCOME NUMBERS AGAINST EACH TOPIC.
### SCHEDULE OF INSTRUCTIONS

#### UNIT PLAN

**Academic Year**: 2012-2013  
**UNIT NO.**: 02

**Semester**: I

**Name of the Program**: M.Tech …P.E… Year: I  
**Section**: A

**Course/Subject**: Programmable Logic Controllers & their applications  
**Code**: GR11D5057

**Name of the Faculty**: ………….M.Chakravarthy…………….  
**Dept.**: E.E.E

**Designation**: HOD.

<table>
<thead>
<tr>
<th>Lesson No.</th>
<th>Date</th>
<th>No. of Periods</th>
<th>Topics / Sub - Topics</th>
<th>Objectives &amp; Outcomes Nos.</th>
<th>References (Text Book, Journal…)</th>
<th>Page Nos.: ____to ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>27/12/2012</td>
<td>2hrs</td>
<td>Input instructions, outputs, procedures</td>
<td>1,2 &amp; 2</td>
<td>John. w.webb .Ronald A.Reis</td>
<td>78 to 84</td>
</tr>
<tr>
<td>2.</td>
<td>03/01/2013</td>
<td>2hrs</td>
<td>Programming examples using contacts and coils</td>
<td>2,3&amp;3</td>
<td></td>
<td>85 to 94</td>
</tr>
<tr>
<td>3.</td>
<td>08/01/2013</td>
<td>2hrs</td>
<td>Drill press operation, digital logic gates</td>
<td>1,2,3 &amp;1,3</td>
<td></td>
<td>94 to 97 102 to 106</td>
</tr>
<tr>
<td>4.</td>
<td>10/01/2013</td>
<td>2hrs</td>
<td>Programming in Boolean algebra, conversion examples</td>
<td>12&amp;2</td>
<td></td>
<td>106 to 113</td>
</tr>
<tr>
<td>5.</td>
<td>17/01/2013</td>
<td>2hrs</td>
<td>Ladder diagrams and sequence listings</td>
<td>2,3&amp;3</td>
<td></td>
<td>118 to 122</td>
</tr>
<tr>
<td>6.</td>
<td>22/01/2013</td>
<td>2hrs</td>
<td>Ladder diagram construction and flow chart for spray process system</td>
<td>2,3&amp;3</td>
<td></td>
<td>122 to 129</td>
</tr>
</tbody>
</table>

Signature of HOD  
Signature of faculty  

**Date**:  

**Note**:  
1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.  
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED IN BOLD  
3. MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUT COME NUMBERS AGAINST EACH TOPIC.
## SCHEDULE OF INSTRUCTIONS

### UNIT PLAN

**Academic Year**: 2012-2013  
**UNIT NO.**: 03

**Semester**: I

**Name of the Program**: M.Tech …P.E… Year: I  
**Section**: A

**Course/Subject**: Programmable Logic Controllers & their applications  
**Code**: GR11D5057

**Name of the Faculty**: …………M.Chakravarthy……………..  
**Dept.**: E.E.E

**Designation**: HOD.

<table>
<thead>
<tr>
<th>Lesson No.</th>
<th>Date</th>
<th>No. of Periods</th>
<th>Topics / Sub - Topics</th>
<th>Objectives &amp; Outcomes Nos.</th>
<th>References (Text Book, Journal…)</th>
<th>Page Nos.: ___to ___</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>24/01/2013</td>
<td>2hrs</td>
<td>characteristics of registers, module addressing</td>
<td>4 &amp; 1,4</td>
<td>John. w.webb .Ronald A.Reis</td>
<td>134 to 135</td>
</tr>
<tr>
<td>2.</td>
<td>29/01/2013</td>
<td>2hrs</td>
<td>Holding registers, input registers, output registers</td>
<td>4 &amp;4</td>
<td></td>
<td>135 to 141</td>
</tr>
<tr>
<td>3.</td>
<td>31/01/2013</td>
<td>2hrs</td>
<td>Timer functions and industrial applications</td>
<td>5,6 &amp;5</td>
<td></td>
<td>144 to 164</td>
</tr>
<tr>
<td>4.</td>
<td>11/02/2013</td>
<td>2hrs</td>
<td>counters, counter function industrial applications</td>
<td>5,6 &amp;5</td>
<td></td>
<td>168 to 176</td>
</tr>
<tr>
<td>5.</td>
<td>14/02/2013</td>
<td>2hrs</td>
<td>Arithmetic functions</td>
<td>6&amp;6</td>
<td></td>
<td>182 to 195</td>
</tr>
<tr>
<td>6.</td>
<td>19/02/2013</td>
<td>2hrs</td>
<td>Number comparison functions, Number conversion functions</td>
<td>6&amp;6</td>
<td></td>
<td>198 to 211 214 to 227</td>
</tr>
</tbody>
</table>

Signature of HOD

Signature of faculty

Date: Date:

**Note**: 1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.  
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED IN BOLD  
3. MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUTCOME NUMBERS AGAINST EACH TOPIC.
**SCHEDULE OF INSTRUCTIONS**

**UNIT PLAN**

**Academic Year**: 2012-2013  
**UNIT NO.: 04**

**Semester**: I  
**Name of the Program**: M.Tech …P.E… Year: I  
**Section**: A  
**Course/Subject**: Programmable Logic Controllers & their applications  
**Code**: GR11D5057  
**Name of the Faculty**: …………M.Chakravarthy…………

<table>
<thead>
<tr>
<th>Lesson No.</th>
<th>Date</th>
<th>No. of Periods</th>
<th>Topics / Sub - Topics</th>
<th>Objectives &amp; Outcomes Nos.</th>
<th>References (Text Book, Journal…)</th>
<th>Page Nos.: ____to ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>21/02/2013</td>
<td>2hrs</td>
<td>Skip, master control relay</td>
<td>6 &amp; 6</td>
<td>John. w.webb .Ronald A.Reis</td>
<td>232 to 237</td>
</tr>
<tr>
<td>2.</td>
<td>25/02/2013</td>
<td>2hrs</td>
<td>Jump, move</td>
<td>6 &amp; 6</td>
<td></td>
<td>242 to 262</td>
</tr>
<tr>
<td>3.</td>
<td>28/02/2013</td>
<td>2hrs</td>
<td>FIFO, FAL, ONS CLR &amp; Sweep functions and their applications</td>
<td>6 &amp; 6</td>
<td></td>
<td>266 to 270</td>
</tr>
<tr>
<td>4.</td>
<td>05/03/2013</td>
<td>2hrs</td>
<td>Bit pattern and Changing a bit shift register</td>
<td>6 &amp; 6</td>
<td></td>
<td>274 to 288</td>
</tr>
<tr>
<td>5.</td>
<td>07/03/2013</td>
<td>2hrs</td>
<td>Sequence functions and applications</td>
<td>6 &amp; 6</td>
<td></td>
<td>292 to 307</td>
</tr>
<tr>
<td>6.</td>
<td>12/03/2013</td>
<td>2hrs</td>
<td>Controlling of two axis and three axes robots with plc matrix functions</td>
<td>7 &amp; 7</td>
<td></td>
<td>310 to 319</td>
</tr>
</tbody>
</table>

Signature of HOD  
Signature of faculty

**Note:**  
1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.  
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED IN BOLD  
3. MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUTCOME NUMBERS AGAINST EACH TOPIC.
# SCHEDULE OF INSTRUCTIONS
## UNIT PLAN

**Academic Year:** 2012-2013  
**UNIT NO.:** 05  
**Semester:** I  
**Name of the Program:** M.Tech …P.E… Year: I  
**Course/Subject:** Programmable Logic Controllers & their applications  
**Code:** GR11D5057  
**Name of the Faculty:** ………….M.Chakravarthy…………….  
**Section:** A  
**Dept.:** E.E.E  

<table>
<thead>
<tr>
<th>Lesson No.</th>
<th>Date</th>
<th>No. of Periods</th>
<th>Topics / Sub - Topics</th>
<th>Objectives &amp; Outcomes Nos.</th>
<th>References (Text Book, Journal…)</th>
<th>Page Nos.: ____to ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>14/03/2013</td>
<td>2hrs</td>
<td>Analog modules and systems</td>
<td>1,7 &amp; 7</td>
<td>John. w.WEBB</td>
<td>338 to 340</td>
</tr>
<tr>
<td>2.</td>
<td>19/03/2013</td>
<td>2hrs</td>
<td>Analog signal processing,</td>
<td>7 &amp; 7</td>
<td>Ronald A.Reis</td>
<td>340 to 343</td>
</tr>
<tr>
<td>3.</td>
<td>21/03/2013</td>
<td>2hrs</td>
<td>Multi bit data processing</td>
<td>7 &amp; 7</td>
<td></td>
<td>343 to 344</td>
</tr>
<tr>
<td>4.</td>
<td>28/03/2013</td>
<td>2hrs</td>
<td>Analog output application examples</td>
<td>7 &amp; 7</td>
<td></td>
<td>344 to 349</td>
</tr>
<tr>
<td>5.</td>
<td>02/04/2013</td>
<td>2hrs</td>
<td>PID principles, position indicator with PID control</td>
<td>7 &amp; 7</td>
<td></td>
<td>352 to 357</td>
</tr>
<tr>
<td>6.</td>
<td>04/04/2013</td>
<td>2hrs</td>
<td>PID modules, PID tuning PID functions</td>
<td>7 &amp; 7</td>
<td></td>
<td>357 to 362</td>
</tr>
</tbody>
</table>

**Signature of HOD**  
**Signature of faculty**

**Date:**  
**Date:**

**Note:**  
1. ENSURE THAT ALL TOPICS SPECIFIED IN THE COURSE ARE MENTIONED.  
2. ADDITIONAL TOPICS COVERED, IF ANY, MAY ALSO BE SPECIFIED IN BOLD  
3. MENTION THE CORRESPONDING COURSE OBJECTIVE AND OUTCOME NUMBERS AGAINST EACH TOPIC.
LESSON PLAN

Academic Year : 2012-2013
Semester : I

Date: 04/12/2012

Name of the Program: M.Tech …P.E… Year: I

Section: A

Course/Subject: Programmable Logic Controllers & their applications

Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..

Section: A

Designation : HOD.

Lesson No: …………01…………………… Duration of Lesson: 2hr ………………….

Lesson Title: ……………PLC System……………………………..

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. To provide knowledge levels needed for PLC programming and operating.

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS : 

Basic PLC system , PLC programming and operating.

Assignment / Questions: 2

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013
Date: 06/12/2012.

Semester : I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy………………
Dept.: E.E.E

Designation : HOD.

Lesson No: …………02……………… Duration of Lesson: 2hr …………………

Lesson Title: I/O modules and interfacing.

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

8. Know devices to which PLC input and output modules are connected.

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

To make the students how devices to which PLC input and output modules are connected.

Assignment / Questions: 2

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos.
LESSON PLAN

Academic Year : 2012-2013 Date: 11/12/2012.
Semester : I
Name of the Program: M.Tech …P.E… Year: I Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: ………..M.Chakravarthy…………….. Dept.: E.E.E
Designation : HOD.
Lesson No: ……………03………… Duration of Lesson: 2hr …………………
Lesson Title: CPU Processor

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know about the CPU Processor.

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :

CPU Processor

Assignment / Questions: 2

Note: Mention for each question the relevant Objectives and Outcomes Nos.
LESSON PLAN

Academic Year : 2012-2013
Date: 13/12/2012.

Semester : II

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..
Dept.: E.E.E

Designation : HOD.

Lesson No: ……….04………… Duration of Lesson: 2hr……………….

Lesson Title: Program equipment, Programming formats

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know Program equipment
2. Know about different Programming formats

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Program equipment, Programming formats

Assignment / Questions: 3

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013                                      Date: 18/12/2012.
Semester       : I                                             
Name of the Program: M.Tech …P.E… Year: I                   Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: .............M.Chakravarthy.................... Dept.: E.E.E
Designation    : HOD.                                          
Lesson No: ...........05........................ Duration of Lesson: 2hr......................
Lesson Title: Construction of PLC ladder diagrams

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Construction of PLC ladder diagrams

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Construction of PLC ladder diagrams

Assignment / Questions: 3

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013

Date: 20/12/2012

Semester : I

Name of the Program: M.Tech …P.E… Year: I

Section: A

Course/Subject: Programmable Logic Controllers & their applications

Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..

Dept.: E.E.E

Designation : HOD.

Lesson No: …………06……………… Duration of Lesson: 2hr………………

Lesson Title: Devices connected to I/O modules

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know different Devices connected to I/O modules

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Devices connected to I/O modules

Assignment / Questions: 2

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)
Bachupally, Kukatpally, Hyderabad – 500 090, A.P., India. (040) 6686 4440

LESSON PLAN

Academic Year : 2012-2013 Date: 27/12/2012.

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E

Designation : HOD.

Lesson No: ………07…………… Duration of Lesson: 2hr …………………

Lesson Title: Input instructions, outputs, procedures

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. : know about Input instructions
2. outputs
3. and procedures

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

| Input instructions, outputs, procedures |

Assignment / Questions: 3

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos.
LESSON PLAN

Academic Year : 2012-2013 Date: 03/01/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………. Dept.: E.E.E

Designation : HOD.

Lesson No: …………08…………… Duration of Lesson: 2hr …………………

Lesson Title: Programming examples using contacts and coils

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Programming using contacts and coils

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Programming using contacts and coils

Assignment / Questions: 3

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos.
LESSON PLAN

Academic Year : 2012-2013
Date: 08/01/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..
Dept.: E.E.E

Designation : HOD.

Lesson No: ………09…………… Duration of Lesson: 2hr……………….

Lesson Title: Drill press operation, digital logic gates

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. construct ladder diagram for Drill press operation

2. different digital logic gates

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Drill press operation,
digital logic gates

Assignment / Questions: 3,5

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013
Semester : I
Name of the Program: M.Tech …P.E… Year: I
Course/Subject: Programmable Logic Controllers & their applications
Name of the Faculty: ………..M.Chakravarthy……………..
Designation : HOD.
Lesson No: ……..10……………… Duration of Lesson: 2hr ……………….

Lesson Title: Programming in Boolean algebra, conversion examples

INSTRUCTIONAL/LESSON OBJECTIVES

On completion of this lesson the student shall be able to:

1. Program in Boolean algebra, conversion examples

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :

Programming in Boolean algebra, conversion examples

Assignment / Questions: 4

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013                Date: 17/01/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I                   Section: A

Course/Subject: Programmable Logic Controllers & their applications  Code: GR11D5057

Name of the Faculty: ………….M.Chakravarthy……………….     Dept.: E.E.E

Designation : HOD.

Lesson No: ………11……………… Duration of Lesson: 2hr …………………

Lesson Title: Ladder diagrams and sequence listings

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Construct Ladder diagrams and sequence listings

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS:

Ladder diagrams and sequence listings

Assignment / Questions: 3

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013          Date: 22/01/2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I          Section: A

Course/Subject: Programmable Logic Controllers & their applications          Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………….          Dept.: E.E.E

Designation : HOD.

Lesson No: …………12………………. Duration of Lesson: 2hr………………..

Lesson Title: Ladder diagram construction and flow chart for spray process system

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. construction of Ladder diagram and flow chart for spray process system

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS:

| Ladder diagram construction and flow chart for spray process system |

Assignment / Questions: 3

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I

Course/Subject: Programmable Logic Controllers & their applications

Name of the Faculty: …………M.Chakravarthy……………..

Designation : HOD.

Lesson No: ……………13…………… Duration of Lesson: 2hr ………………….

Lesson Title: characteristics of registers, module addressing

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know different characteristics of registers, module addressing

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

characteristics of registers, module addressing

Assignment / Questions: 4

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013
Date: 29/01/2013
Semester : I
Name of the Program: M.Tech …P.E… Year: I
Section: A
Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057
Name of the Faculty: …………M.Chakravarthy……………..
Dept.: E.E.E
Designation : HOD.
Lesson No: ……………14……………… Duration of Lesson: 2hr …………………

Lesson Title: Holding registers, input registers, output registers

INSTRUCTIONAL/LESSON OBJECTIVES:
On completion of this lesson the student shall be able to:
1. know Holding registers, input registers, output registers

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS : 
- Holding registers, input registers, output registers

Assignment / Questions: 4

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos.
LESSON PLAN

Academic Year : 2012-2013
Date: 31/01/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..
Dept.: E.E.E

Designation : HOD.

Lesson No: ……………15……………. Duration of Lesson: 2hr …………………

Lesson Title: Timer functions and industrial applications

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know Timer functions and industrial applications

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Timer functions and industrial applications

Assignment / Questions: 5

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013
Date: 11/02/2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..
Dept.: E.E.E

Designation : HOD.

Lesson No: ……………16…………… Duration of Lesson: 2hr …………………

Lesson Title: counters, counter function industrial applications

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know counters, counter function industrial applications

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :

counters, counter function industrial applications

Assignment / Questions: 5

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos.
LESSON PLAN

Academic Year : 2012-2013
Date: 14/02/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I

Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..

Dept.: E.E.E

Designation : HOD.

Lesson No: …………17………………… Duration of Lesson: 2hr …………………

Lesson Title: Arithmetic functions

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know various Arithmetic functions

Assignment / Questions: 6

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013
Date: 19/02/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..
Dept.: E.E.E

Designation : HOD.

Lesson No: …………18……………… Duration of Lesson: 2hr……………….

Lesson Title: Number comparison functions, Number conversion functions

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:
1. know various Number comparison functions,
2. Number conversion functions

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Number comparison functions, Number conversion functions

Assignment / Questions: 6

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013
Date: 21/02/2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy………………..
Dept.: E.E.E

Designation : HOD.

Lesson No: …………19…………… Duration of Lesson: 2hr …………………

Lesson Title: Number comparison functions, Number conversion functions

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Number comparison functions, Number conversion functions

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :

Number comparison functions, Number conversion functions

Assignment / Questions: 6

Note: Mention for each question the relevant Objectives and Outcomes Nos..

Signature of faculty
LESSON PLAN

Academic Year : 2012-2013
Date: 25/02/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: ………M.Chakravarthy………………..
Dept.: E.E.E

Designation : HOD.

Lesson No: …………20……………… Duration of Lesson: 2hr …………………

Lesson Title: Jump, move

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know data Handling functions Jump, move

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

data Handling functions Jump, move

Assignment / Questions: 6

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013 Date: 28/02/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: ……….M.Chakravarthy…………….. Dept.: E.E.E

Designation : HOD.

Lesson No: ……………21…………….. Duration of Lesson: 2hr …………………..

Lesson Title: FIFO, FAL, ONS CLR & Sweep functions and their applications

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know FIFO, FAL, ONS CLR & Sweep functions and their applications

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

FIFO, FAL, ONS CLR & Sweep functions and their applications

Assignment / Questions: 6

Note: Mention for each question the relevant Objectives and Outcomes Nos.

Signature of faculty
LESSON PLAN

Academic Year: 2012-2013
Date: 05/03/2013.

Semester: I

Name of the Program: M.Tech …P.E… Year: I
Section: A

Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..
Dept.: E.E.E

Designation: HOD.

Lesson No: ……………22…………… Duration of Lesson: 2hr …………………

Lesson Title: Bit pattern and Changing a bit shift register

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:
1. to know Bit pattern and Changing a bit shift register

TEACHING AIDS: White Board, Marker, LCD Projector, Duster

TEACHING POINTS:

Bit pattern and Changing a bit shift register

Assignment / Questions: 6

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year: 2012-2013  Date: 07/03/2013.
Semester: I

Name of the Program: M.Tech …P.E… Year: I  Section: A
Course/Subject: Programmable Logic Controllers & their applications  Code: GR11D5057
Name of the Faculty: ……………M.Chakravarthy………………..  Dept.: E.E.E
Designation:  HOD.
Lesson No: …………23………………. Duration of Lesson: 2hr …………………

Lesson Title: Sequence functions and applications

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know about Sequence functions and applications

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :

| Sequence functions and applications |

Assignment / Questions: 6

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013
Semester : I
Name of the Program: M.Tech …P.E… Year: I
Course/Subject: Programmable Logic Controllers & their applications
Name of the Faculty: …………M.Chakravarthy……………..
Designation : HOD.
Lesson No: ……………24……………… Duration of Lesson: 2hr ………………
Lesson Title: Controlling of two axis and three axes robots with plc matrix functions

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Control of two axis and three axes robots with plc matrix functions

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :
Controlling of two axis and three axes robots with plc matrix functions

Assignment / Questions: 7

Signature of faculty
Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013

Date: 14/03/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I

Section: A

Course/Subject: Programmable Logic Controllers & their applications

Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy………………..

Dept.: E.E.E

Designation : HOD.

Lesson No: ……………25……………… Duration of Lesson: 2hr ………………….

Lesson Title: Analog modules and systems

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know Analog modules and systems

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Analog modules and systems

Assignment / Questions: 7

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013                             Date: 19/03/2013.
Semester : I

Name of the Program: M.Tech …P.E… Year: I                    Section: A
Course/Subject: Programmable Logic Controllers & their applications   Code: GR11D5057
Name of the Faculty: …………M.Chakravarthy……………..     Dept.: E.E.E
Designation : HOD.

Lesson No: ……………26……………… Duration of Lesson: 2hr ……………

Lesson Title: Analog signal processing

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Analog signal processing

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Analog signal processing

Assignment / Questions: 7

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013               Date: 21/03/2013.
Semester : I

Name of the Program: M.Tech …P.E… Year: I               Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: ……………M.Chakravarthy………………. Dept.: E.E.E
Designation : HOD.

Lesson No: …….27…… Duration of Lesson:  2hr …………………

Lesson Title: Multi bit data processing

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know about Multi bit data processing

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :

Multi bit data processing

Assignment / Questions: 7

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year: 2012-2013
Semester: I

Date: 28/03/2013.

Name of the Program: M.Tech …P.E… Year: I
Course/Subject: Programmable Logic Controllers & their applications
Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..
Designation: HOD.

Lesson No: …………28……………… Duration of Lesson: 2hr

Lesson Title: Analog output application examples

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Analog output application examples

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

Analog output application examples

Assignment / Questions: 7

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013  Date: 02/04/2013.

Semester : I

Name of the Program: M.Tech …P.E… Year: I  Section: A

Course/Subject: Programmable Logic Controllers & their applications  Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..  Dept.: E.E.E

Designation : HOD.

Lesson No: ………………29…………… Duration of Lesson: 2hr …………………

Lesson Title: PID principles, position indicator with PID control

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know PID principles, position indicator with PID control

TEACHING AIDS : White Board, Marker, LCD Projector, Duster

TEACHING POINTS :

- PID principles, position indicator with PID control

Assignment / Questions: 7

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
LESSON PLAN

Academic Year : 2012-2013  Date: 04/04/2013.
Semester : I

Name of the Program: M.Tech …P.E… Year: I  Section: A
Course/Subject: Programmable Logic Controllers & their applications  Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………..  Dept.: E.E.E
Designation : HOD.

Lesson No: …………30……………… Duration of Lesson: 2hr ………………….

Lesson Title: PID modules, PID tuning PID functions

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. know  PID modules, PID tuning PID functions

TEACHING AIDS : White Board, Marker, LCD Projector, Duster
TEACHING POINTS :

PID modules, PID tuning PID functions

Assignment / Questions: 7

Signature of faculty

Note: Mention for each question the relevant Objectives and Outcomes Nos..
ASSIGNMENT SHEET – 1

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E

Designation : HOD.

This Assignment corresponds to Unit No. / Lesson …………01/ PLC Basics …………. …………

Q1. In detail explain the solid state memory and memory mapping in PLC.

Q2. What are the advantages of PLC based control over the hard wired logic controls.

List out disadvantages if any.

Q3. Explain the operational sections of PLC CPU.

Q4. Explain Lay out of interfacing the Input module. Also explain the interfacing of output module.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos: 1,2,3

Outcome Nos.: 1,2,3

Signature of HOD Signature of faculty

Date: Date:
ASSIGNMENT SHEET – 2

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E

Designation : HOD.

This Assignment corresponds to Unit No. / Lesson ……02/ PLC programming, ladder diagrams for Process control…………..

Q1. List the basic seven digital gate types, describe their function with their symbols along with suitable examples.

Q2. Describe the construction of PLC ladder diagrams.

Q3. Discuss the importance of FAIL-SAFE switches.

Q4. Using a contact and coil programming explain (a) Standard start stop seal circuit and (b) Standard forward reverse circuit.

Q5. Explain how ladder diagrams are created from process controlled descriptions.

Q6. Explain the procedural steps involved in drill press operation with a PLC ladder diagram.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 2,3
Outcome Nos.: 2,3

Signature of HOD
Signature of faculty

Date: Date:
ASSIGNMENT SHEET – 3

Academic Year : 2012-2013
Semester : I
Name of the Program: M.Tech …P.E… Year: I Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E
Designation : HOD.

This Assignment corresponds to Unit No. / Lesson …..03/ PLC Registers, PLC functions …………..

Q1. Explain different types of PLC Timers.

Q2. Discuss the following in detail:
   a) Holding Registers b) Input Registers c) Output Registers

Q3. Explain different types of counters

Q4. What are the characteristics of PLC registers?

Q5. Explain the basic comparison functions of a PLC

Q6. How many configurations are there for PLC counter functions? Explain.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 4,5
Outcome Nos.:4,5

Signature of HOD
Date:

Signature of faculty
Date:
ASSIGNMENT SHEET – 4

Academic Year : 2012-2013
Semester : I
Name of the Program: M.Tech …P.E… Year: I Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: ………..M.Chakravarthy…………….. Dept.: E.E.E
Designation : HOD.

This Assignment corresponds to Unit No. / Lesson ………04/ Data Handling Functions ………

Q1. Explain JUMP with RETURN with an application

Q2. Explain FIFO load and FIFO unload functions with examples.

Q3. Explain the PLC sequencer Functions.

Q4. Explain the design of Two axis robot with PLC sequencer control.

Q5. Explain the SKIP function with an application

Q6. How many configurations are there for PLC counter functions? Explain

Q7. Explain the FAL function of a PLC with a schematic of its operations

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:6,7
Outcome Nos.: 6,7
Signature of HOD
Date:
Signature of faculty
Date:
ASSIGNMENT SHEET – 5

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E

Designation : HOD.

This Assignment corresponds to Unit No. / Lesson ………05/ Analog plc operation ……….

Q1. Write short notes on the following:
   a) Input, output devices connected to PLC
   b) PLC analog signal processing
   c) PID tuning.

Q2. Write short notes on PLC Master control Relay.

Q3. Write short notes on:
   a) Number conversion functions
   b) Typical PID functions
   c) BCD or multibit data processing.

Q4. Write short notes on
   a) ONS and CLR functions
   b) PLC analog modules
   c) PID modules.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:7
Outcome Nos.: 7

Signature of HOD

Date:

Signature of faculty

Date:
TUTORIAL SHEET - 1

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E

Designation : HOD.

This Tutorial corresponds to Unit No. / Lesson ……………01/ PLC Basics………..

Q1. Explain the architecture of a PLC system and discuss about its components in detail.

Q2. Discuss about various programming equipment required for PLC programming

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 1,2

Outcome Nos.:1,2

Signature of HOD

Signature of faculty

Date:
TUTOTRIAL SHEET - 2

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: ………….M.Chakravarthy………….. Dept.: E.E.E

Designation : HOD.

This Tutorial corresponds to Unit No. / Lesson…02/ PLC programming, ladder diagrams for process control.

Q1. Design the operation of a drill press module and draw the necessary Ladder diagram

Q2. Explain the following
   i) AND gate and relay and PLC equivalents
   ii) NOR gate and relay and PLC equivalents.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:3

Outcome Nos.: 3

Signature of HOD Signature of faculty

Date: Date:
TUTOTRIAL SHEET - 3

Academic Year : 2012-2013

Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A

Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy……………… Dept.: E.E.E

Designation : HOD.

This Tutorial corresponds to Unit No. / Lesson ………03/ PLC Registers, PLC functions….

Q1. List the five major types of PLC Registers. Use a block diagram to show where each type fits in to the PLC scheme of operation.

Q2. Discuss about the advanced comparison functions of PLC and explain one of their applications.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos: 4,6

Outcome Nos.:4,6

Signature of HOD

Signature of faculty

Date:
TUTORIAL SHEET - 4

Academic Year : 2012-2013
Semester : I

Name of the Program: M.Tech …P.E… Year: I Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057

Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E

Designation : HOD.

This Tutorial corresponds to Unit No. / Lesson …04 / Data Handling Functions………………..

Q1. Explain the JUMP with NON-RETURN with an application.

Q2. Explain the FAL function of a PLC with a schematic of its operations.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.: 6
Outcome Nos.6

Signature of HOD Signature of faculty

Date: Date:
TUTOTRIAL SHEET - 5

Academic Year : 2012-2013
Semester : I
Name of the Program: M.Tech …P.E… Year: I Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E
Designation : HOD.
This Tutorial corresponds to Unit No. / Lesson ….05 / Analog plc operation………………

Q1. Write short notes on typical PID functions

Q2. Explain PLC analog signal processing.

Please write the Questions / Problems / Exercises which you would like to give to the students and also mention the Objectives/Outcomes to which these Questions / Problems / Exercises are related.

Objective Nos.:7

Outcome Nos.: 7

Signature of HOD

Signature of faculty

Date:
EVALUATION STRATEGY

Academic Year : 2012-2013
Semester : I
Name of the Program: M.Tech …P.E… Year: I Section: A
Course/Subject: Programmable Logic Controllers & their applications Code: GR11D5057
Name of the Faculty: …………M.Chakravarthy…………….. Dept.: E.E.E
Designation : HOD.

1. TARGET:
   a) Percentage for pass:
   b) Percentage of class:

2. COURSE PLAN & CONTENT DELIVERY
   • Ppt presentation of lectures
   • Giving assignments
   • demonstration of models

3. METHOD OF EVALUATION

   3.1 □ Continuous Assessment Examinations (CAE-I, CAE-II)
   3.2 □ Assignments
   3.3 □ Seminars
   3.4 □ Quiz
   3.5 □ Semester/End Examination

Signature of HOD Signature of faculty
Date: Date:
Result Analysis

Subject: PLCA

<table>
<thead>
<tr>
<th>Academic year</th>
<th>No. of Students appeared</th>
<th>No. of students passed</th>
<th>No. of students failed</th>
<th>&lt;60%</th>
<th>60% to 70%</th>
<th>&gt;70%</th>
<th>pass %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2010-11</td>
<td>17</td>
<td>15</td>
<td>2</td>
<td>1</td>
<td>3</td>
<td>11</td>
<td>88%</td>
</tr>
<tr>
<td>2011-12</td>
<td>15</td>
<td>15</td>
<td>0</td>
<td>2</td>
<td>4</td>
<td>9</td>
<td>100%</td>
</tr>
<tr>
<td>2012-13</td>
<td>15</td>
<td>13</td>
<td>2</td>
<td>0</td>
<td>7</td>
<td>6</td>
<td>86.60%</td>
</tr>
</tbody>
</table>
Model Question paper
PROGRAMMABLE LOGIC CONTROLLERS & THEIR APPLICATIONS
Time: 3 hours Max. Marks: 60
Answer any FIVE questions
All Questions Carry Equal Marks

1. Explain the architecture of a PLC system and discuss about its components in detail. [12]

2. a) How many types of PLC input instructions are there? Explain a typical PLC input scheme.
   b) Explain the operation of a drill press module and draw the necessary Ladder diagram. [12]

3. a) Discuss the PLC equivalents of digital logic gates.
   b) What are the various steps involved in the construction of Ladder diagram for Spray Process control? Explain. [12]

4. Discuss the following in detail:
   a) Holding Registers b) Input Registers c) Output Registers [12]

5. a) Explain different types of PLC Timers.
   b) A motor and its lubrication pump are both running. Lubrication for main motor bearings is required during motor coast-down. After the main motor is shut off, the lubricating pump remains on for a time of 20 seconds corresponding to the coast-down time. Using an off delay circuit, generate the necessary program and circuit. [12]

6. a) Explain JUMP with RETURN with an application.
   b) Explain FIFO load and FIFO unload functions with examples. [12]

7. a) Design a Morse Code system with Shift register function.
   b) Explain the PLC sequencer Functions. [12]

8. Write short notes on the following:
   a) Input, output devices connected to PLC
   b) PLC analog signal processing
   c) PID tuning. [12]

*** ***
Model Question paper

PROGRAMMABLE LOGIC CONTROLLERS & THEIR APPLICATIONS

Time: 3hours Max. Marks: 60
Answer any FIVE questions
All Questions Carry Equal Marks

1. a) Discuss about various programming equipments required for PLC programming. [12]
   b) Explain the construction of PLC ladder diagrams.

2. a) Explain a typical PLC output scheme [12]
   b) Design the operation of a drill press module and draw the necessary Ladder diagram.

3. a) Construct a ladder and relay logic for a 4 input conveyor ‘C’ has to run when any of the four inputs is ON. Derive the necessary Boolean expression. [12]
   b) Draw the necessary ladder diagram for spray process control.

4. What are the characteristics of PLC registers? Explain the function of any two types of PLC registers in detail. [12]

5. a) How many configurations are there for PLC counter functions? Explain. [12]
   b) Discuss the application of a dual counter for parts to be counted on a conveyor belt. Assume required design considerations.

6. a) Explain the SKIP function with an application. [12]
   b) How do you move blocks of PLC data? Explain different methodologies.

7. a) Explain the design of Two axis robot with PLC sequencer control. [12]
   b) How do you change the bit pattern of a PLC register? Explain.

8. Write short notes o the following:
   a) Input output devices connected to PLC
   b) PLC analog signal processing
   c) PLC Master control Relay. [12]

* * * * *
Model Question paper
PROGRAMMABLE LOGIC CONTROLLERS & THEIR APPLICATIONS
Time: 3hours Max. Marks: 60
Answer any FIVE questions
All Questions Carry Equal Marks

1.a) What are the components of a PLC?
b) What are the functions of PLC CPU? Explain their operational sequence. [12]

2.a) Discuss the importance of FAIL-SAFE switches.
b) There are three machines, each with its own start-stop buttons. Only one may run at a time. Construct a circuit with appropriate interlocking. [12]

3.a) Explain the following
i) AND gate and relay and PLC equivalents
ii) NOR gate and relay and PLC equivalents.
b) Discuss about ladder diagrams and sequence listings. [12]

4. List the five major types of PLC Registers. Use a block diagram to show where each type fits in to the PLC scheme of operation. [12]

5.a) Explain the basic comparison functions of a PLC.
b) Discuss about the advanced comparison functions of PLC and explain one of their applications. [12]

6.a) Explain the JUMP with NON-RETURN with an application.
b) Explain the FAL function of a PLC with a schematic of its operations [12]

7.a) How do you change the status of bit pattern of a register? Explain.
b) Using a PLC sequencer and timing. Explain the following dishwasher application.
> Soap release solenoid
> Input valve for hot water
> Wash impeller operation
> Drain water valve
> Drain pump motor
> Heat element for drying cycle [12]

8. Write short notes on:
a) Number conversion functions
b) Typical PID functions
c) BCD or multibit data processing. [12]