

**Ramgarhia Polytechnic College,**  
**Phagwara**



**Electrical Engineering Department**

|                       |                                   |
|-----------------------|-----------------------------------|
| Head of Department:   | S. Jasvir Singh                   |
| Name of the Faculty:  | Er. Amandeep Singh                |
| Discipline:           | Electrical Engineering Department |
| Semester:             | 3 <sup>rd</sup>                   |
| Subject:              | ELECTRICAL WORKSHOP PRACTICE - I  |
| Lesson Plan Duration: | 16 Weeks                          |

**RATIONALE**

An electrical diploma holder will be required to inspect, test and modify the work done by skilled workers working under him. In addition, many a times, it will become necessary for him to demonstrate the correct method and procedure of doing a job. In order to carry out this function effectively in addition to conceptual understanding of the

method or procedure he must possess appropriate manual skills. The subject aims at developing special skills required for repairing, fault finding, wiring in electrical appliances and installations.

### Learning Outcomes

- After undergoing the subject, students will be able to:
- Illustrate types of tools/equipment
- Describe domestic and industrial applications of electric circuits
- Detect and rectify faults in circuits Identify electrical hazards and its safety measures
- Assemble distribution and extension boards
- Construct alarm and indicating circuits using relays, bells, push buttons
- Install electrical wiring and test it using meggar

| PO ⇒ | PO1   | PO2   | PO3   | PO4 | PO5 | PO6 | PO7 |
|------|---|---|---|-----|-----|-----|-----|
| CO ⇩ |   |   |   |     |     |     |     |
| CO1  |  |   |   |     |     |     |     |
| CO2  |   |  |   |     |     |     |     |
| CO3  |   |  |   |     |     |     |     |
| CO4  |   |  |   |     |     |     |     |
| CO5  |  |   |   |     |     |     |     |
| CO6  |   |  |  |     |     |     |     |
| CO7  |  |  |   |     |     |     |     |

## Syllabus

| PRACTICAL | Details  |
|-----------|--|
| 1.        | Wire jointing <ul style="list-style-type: none"> <li>• Straight married joint</li> <li>• Joint</li> <li>• Western union joint</li> <li>• Britania joint</li> <li>• Twist sleeve joint</li> <li>• Bolted type joint</li> </ul>  |
| 2.        | Types of wiring and to make different light control circuits in the following types of wiring: <ul style="list-style-type: none"> <li>• Casing and capping (PVC) wiring.</li> <li>• Conduit wiring (surface/concealed), Filling and crimping of thimbles</li> </ul>  |
| 3.        | Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses (only internal connection) Types of wiring and to make different light control circuits in the following types of wiring: <ul style="list-style-type: none"> <li>• Casing and Capping (PVC) wiring</li> <li>• Conduit wiring (surface/concealed)</li> </ul>  |
| 4.        | Construction/assembly of Distribution Board and Extension Board <ul style="list-style-type: none"> <li>• Construction of an extension board with two 5A sockets and one 15A Socket controlled by their respective switches, a fuse and indicator with series test lamp provision.</li> <li>• Assembly of distribution board panel using MCB, main switch, change over switch and ELCB/RCCB.</li> <li>• Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses (only internal connection)</li> </ul> |

|    |  |
|----|--|
| 5. | <p>Simple light and Alarm Circuits (any four)</p> <ul style="list-style-type: none"> <li>• One lamp controlled by two switches (staircase circuit)</li> <li>• Two lamps controlled by three switches (double staircase circuit)</li> <li>• Two ordinary bells (for day and night) used at a distant residence</li> <li>• Bell response circuit using one bell and one relay</li> <li>• Bell response circuit of an office (for three rooms)</li> <li>• Traffic light control system for two roads crossing</li> <li>• Wiring of a switch board containing at least two switches, one fan regulator and one 5/15A socket controlled by their respective switches using piano type switches and matching socket</li> </ul> |
| 6. | Wiring of a series test lamp board and to use it for finding out simple faults   |
| 7. | Testing of domestic wiring installation using meggar   |
| 8  | Fault finding and repair of a tube light circuit   |
| 9  | Wiring and testing of alarm and indicating circuits using relay, push buttons and bells (simple single-phase circuits)   |
| 10 | Assembly of distribution board/ panel using MCB, main switch, changeover switch and ELCB etc.  |

## REFERENCE BOOK

Electrical workshop practice-1 Surbhi Angrish Resham Singh (IPH)

### **Delivery/Instructional Methodologies**

| Sr.No. | Description             |
|--------|-------------------------|
| 1.     | Chalk and Talk          |
| 2.     | PowerPoint Presentation |

### **Assessment Methodologies**

| Sr. No. | Description        | Type   |
|---------|--------------------|--------|
| 1.      | Student Assignment | Direct |
| 2.      | Test               | Direct |
| 3.      | Board Examination  | Direct |
| 4.      | Student Feedback   | Direct |

### **Gaps in the syllabus - to meet industry/profession requirements**

| S.NO. | DESCRIPTION | PROPOSED ACTIONS | PO MAPPING |
|-------|-------------|------------------|------------|
|       | N/A         | N/A              | N/A        |

### **Topics beyond syllabus/advanced topics**

| Units | Details | Hours |
|-------|---------|-------|
| N/A   | N/A     | N/A   |

## Web Source References

| Sr. No. | URL   |
|---------|---|
| 1.      | <a href="https://nptel.ac.in/">https://nptel.ac.in/</a> |

## Lesson Plan

| Week            | Practical Day |  |
|-----------------|---------------|--|
| 1 <sup>st</sup> | 1 to 8        | <p>Wire jointing</p> <ul style="list-style-type: none"> <li>• Straight married joint</li> <li>• Joint</li> <li>• Western union joint</li> <li>• Britania joint</li> <li>• Twist sleeve joint</li> </ul> <p>Bolted type joint</p>   |
| 2 <sup>nd</sup> | 9 to 16       | <p>Types of wiring and to make different light control circuits in the following types of wiring:</p> <ul style="list-style-type: none"> <li>• Casing and capping (PVC) wiring.</li> </ul> <p>Conduit wiring (surface/concealed), Filling and crimping of thimbles</p>   |
| 3 <sup>rd</sup> | 17 to 24      | <p>Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses (only internal connection) Types of wiring and to make different light control circuits in the following types of wiring:</p> <ul style="list-style-type: none"> <li>• Casing and Capping (PVC) wiring</li> </ul> <p>Conduit wiring (surface/concealed)</p> |

|                 |          |  |
|-----------------|----------|--|
| 4 <sup>th</sup> | 25 to 32 | <p>Construction/assembly of Distribution Board and Extension Board</p> <ul style="list-style-type: none"><li>• Construction of an extension board with two 5A sockets and one 15A Socket controlled by their respective switches, a fuse and indicator with series test lamp provision.</li><li>• Assembly of distribution board panel using MCB, main switch, change over switch and ELCB/RCCB.</li></ul> <p>Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses (only internal connection)</p> |
|-----------------|----------|--|

|                 |          |  |
|-----------------|----------|--|
| 5 <sup>th</sup> | 33 to 40 | <p>(REVISE)</p> <p>Construction/assembly of Distribution Board and Extension Board</p> <ul style="list-style-type: none"><li>• Construction of an extension board with two 5A sockets and one 15A Socket controlled by their respective switches, a fuse and indicator with series test lamp provision.</li><li>• Assembly of distribution board panel using MCB, main switch, change over switch and ELCB/RCCB.</li></ul> <p>Wiring of main distribution board with four outgoing circuits for light and fan loads including main switch and fuses (only internal connection)</p> |
|-----------------|----------|--|



|                 |          |  |
|-----------------|----------|--|
|                 |          | Simple light and Alarm Circuits (any four) <ul style="list-style-type: none"> <li>• One lamp controlled by two switches (staircase circuit)</li> <li>• Two lamps controlled by three switches (double staircase circuit)</li> <li>• Two ordinary bells (for day and night) used at a distant residence</li> <li>• Bell response circuit using one bell and one relay</li> <li>• Bell response circuit of an office (for three rooms)</li> <li>• Traffic light control system for two roads crossing</li> </ul> Wiring of a switch board containing at least two switches, one fan regulator and one 5/15A socket controlled by their respective switches using piano type switches and matching socket |
| 6 <sup>th</sup> | 41 to 48 |  |
| 7 <sup>th</sup> | 49 to 56 | Wiring of a series test lamp board and to use it for finding out simple faults   |
| 8 <sup>th</sup> | 57 to 64 | Testing of domestic wiring installation using meggar   |
| 9 <sup>th</sup> | 65 to 72 | Fault finding and repair of a tube light circuit   |

|                  |          |  |
|------------------|----------|--|
| 10 <sup>th</sup> | 73 to 80 | Wiring and testing of alarm and indicating circuits using relay, push buttons and bells (simple single-phase circuits)           |
| 11 <sup>th</sup> | 81 to 88 | (REVISED) Wiring and testing of alarm and indicating circuits using relay, push buttons and bells (simple single-phase circuits) |

|                  |            |   |
|------------------|------------|---|
| 12 <sup>th</sup> | 89 to 96   | Assembly of distribution board/ panel using MCB, main switch, changeover switch and ELCB etc. |
| 13 <sup>th</sup> | 97 to 104  | (REVISED)   |
|                  |            |   |
| 14 <sup>th</sup> | 105 to 112 | (REVISED)   |
|                  |            |   |
| 15 <sup>th</sup> | 113 to 120 | (REVISED)   |
|                  |            |   |

|                  |               |                                      |
|------------------|---------------|--------------------------------------|
| 16 <sup>th</sup> | 121 to<br>128 | (REVISED) PTM VIVA<br>CHECK NOTEBOOK |
|                  |               |                                      |

**NBA has defined the following seven POs for an Engineering diploma graduate:**

- i) **Basic and Discipline specific knowledge:** Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

- ii) **Problem analysis:** Identify and analyze well-defined engineering problems using codified standard methods.
- iii) **Design/ development of solutions:** Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.
- iv) **Engineering Tools, Experimentation and Testing:** Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.
- v) **Engineering practices for society, sustainability and environment:** Apply appropriate technology in context of society, sustainability, environment and ethical practices.
- vi) **Project Management:** Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.
- vii) **Life-long learning:** Ability to analyze individual needs and engage in updating in the context of technological changes.

### **Program Specific Outcomes (PSOs)**

PSOs are a statement that describes what students are expected to know and be able to do in a specialized area of discipline upon graduation from a program. Program may specify 2-4 program specific outcomes, if required.

These are the statements, which are specific to the particular 11 program. They are beyond POs. Program Curriculum and other activities during the program must help in the achievement of PSOs along with POs.