

CCPD

Assignment Booklet

**Certificate of Competency
in Power Distribution
(*Electrical Technicians*)**

**Programme Code:
CCPD**

Course Code:

OEE-001

OEE-002



School of Engineering and Technology
Indira Gandhi National Open University
Maidan Garhi, New Delhi – 110 068

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Dear Student,

This booklet contains the assignments for the CCPD Programme for the theory courses of OEE-001; OEE-002. **It is for your kind information that each theory course has one assignment, which is based on course material of these courses.** You are also advised to write your responses after comprehensive study your subject. **This to inform that minimum duration of this programme is 6 months and maximum duration is 2 years.**

Please note, assignments submission is prerequisite to appear in your Term End Examination (TEE) in the month of June and December of every year.

You need to submit the assignments as under:

For January Session- By 30th April/May ; For July Session- By 30th October/November

You are advised not to wait for the last date to submit your assignments.

You can submit your assignment-

At your concern **Study Centre/Regional Centre** on or before the due date (in person). Student are advised to get the acknowledgement/receipt while submitting assignment at Study Centre/Regional Centre concerned in order to fill up assignment submission details in your term end examination form.

We strongly feel that you should retain a photocopy of your assignment answer sheet duly acknowledged by the office of the Coordinator/ Study Centre/ Regional Centre to avoid any unforeseen situation.

For Formatting of Your Assignments

- **On the top of the first page of your Tutor Marked Assignment (TMA) answer sheet,** please write the details exactly in the following format :

Enrolment No. _____	Date : _____
Course Code : _____	Course Title : _____
Name : _____	Address : _____
Regional Centre/Study CentreCode: _____	

Signature :	E mail:
	Mobile No.:

- Please follow the above format strictly to facilitate evaluation and avoid delay.
- Use only foolscap size writing paper (but not of very thin variety) for writing your answers.
- Leave 3 cm margin on the left, top and bottom of your answer sheet.
- Your answer should be logical and coherent.
- While solving problems, clearly indicate the question number along with the part being solved. Recheck your work before submitting it.

Wishing you all good luck!

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TUTOR MARKED ASSIGNMENT**OEE-001****ELECTRICITY AND SAFETY MEASURES****Maximum Marks: 100**
Weightage : 30%**Course Code: OEE-001****Note:** All questions are compulsory and carry equal marks.

- Q.1 (a) Explain terms Current, Voltage, Power, Energy and Efficiency.
(b) In an electrical system what is the importance of active power and reactive power?
- Q.2 (a) What are inductors and Capacitors? Explain different quality parameters in electrical power supply.
(b) Explain Generation, Transmission and Distribution of power using a block diagram.
- Q.3 (a) Explain various tools available to a electrical technician. What precaution any electrician should take while handling various tools?
(b) What are the essential items to be kept in a First Aid Box?
- Q.4 (a) Explain three essential factors for fire extinguishing?
(b) Write various precautions and safety rules to prevent fire accidents. Write down various measures, which can be taken to avoid fire in electrical cables.
- Q.5 (a) Why do we prefer high voltage to transmit electrical power for transmission lines?
(b) What is Grid? How does a Grid improve reliability?
- Q.6 (a) What is Earthing? Explain different methods of equipment earthing.
(b) What steps are required for maintenance of earthing in electrical installations? Why do you need to measure earth resistivity?
- Q.7 (a) What are the uses of relay as a protection device? Describe working of protective relays and circuit breaker with neat circuit diagram.
(b) What is the speciality of minimum time delay relay? Write different types of relays with their respective applications.
- Q.8 (a) What are various personal protective equipments to be used for safety?
(b) Write Do's and Don'ts for electrical safety in case of domestic consumers.
- Q.9 (a) Explain the concept of cardiopulmonary resuscitation(CPR). How it is facilitated.
(b) What are the essential items to be kept in a First Aid Box? Write first aid treatment in case of a fall resulting in situation like:(i) Unconsciousness,(ii)Nose Bleeding.
- Q.10 (a) Explain the importance of proper training required to encounter any disaster?
(b) Name some alternative power generating processes in case of a disaster.

TUTOR MARKED ASSIGNMENT**OEE-002****POWER DISTRIBUTION SYSTEM – BASICS****Maximum Marks: 100**
Weightage : 30%**Course Code: OEE-002****Note:** All questions are compulsory and carry equal marks.

- Q.1 (a) Describe power distribution in brief. Write specific use of main equipment required for overhead lines.
- (b) How does higher voltage reduce electric power losses? What are the advantages of High Voltage Distribution Systems (HVDS) compared to low voltage distribution system.
- Q.2 (a) What are feeders? Explain about configuration of feeders with advantages and disadvantages and draw layouts.
- (b) Describe (i) Clamp meters (ii) Instrument transformers
- Q.3 (a) Explain transformer construction with suitable diagram. What are important reasons for transformer failure, explain?
- (b) Write down various maintenance considerations for transformers.
- Q.4 (a) Describe the equipments required for the construction of a 66-33/11 KV substation.
- (b) Differentiate between preventive maintenance and Breakdown maintenance.
Explain general maintenance practices for substation and distribution lines.
- Q.5 (a) Describe construction of power cables. Also, explain various types of faults in power cables.
- (b) Write various types of cable jointing methods and also explain important cable jointing instructions.
- Q.6 (a) What are Technical losses and Commercial losses in distribution?
- (b) Why was the T&D loss assessment changed to AT&C loss determination in distribution?
- Q.7 (a) Explain various long term plans for technical loss reduction in distribution systems.
- (b) Write down various measures for controlling direct tapping by non- customers and customers.
- Q.8 (a) Write available technology options available for metering. Explain various meter installation practices adopted to guard against meter tampering.
- (b) Explain role of energy accounting and auditing in preventing revenue loss.
- Q.9 (a) Elaborate Indian electricity rules regarding electrical safety for handling of electrical supply lines and apparatus.
- (b) Write short note on legal measures that can be taken in accordance with the Electricity Act ,2003 to prevent power theft and other irregularities.
- Q.10 Appreciate the role and significance of technological interventions in metering, billing and collection for the utility's revenue protection.

CCPD

WORK GUIDE

PRACTICAL TRAINING/ INTERNSHIP/ FIELD VISIT

**Certificate of Competency
in Power Distribution
(*Electrical Technicians*)**

Programme Code:

CCPD

Course:

PRACTICAL IN POWER DISTRIBUTION

(COURSE CODE:OEEL001)



School of Engineering and Technology
Indira Gandhi National Open University
Maidan Garhi, New Delhi – 110 068

Dear Student,

This booklet contains the practical training/internship/field visit work guide for the CCPD Programme for the practical course of OEEL-001. You are also advised to write your responses after comprehensive study your subject .

Please note, work report is prerequisite to clear your Term End Examination (TEE) of this practical course.

You need to submit the work report as under:

For January Session- By 30th May ; For July Session- By 30th November

This to inform you that minimum duration of this programme is 6 months and maximum duration is 2 years.

You can submit your Practical /Internship/Field Visit Work Report at your concern **Study Centre/Regional Centre** on or before the due date (in person) .Check minimum and maximum duration of CCPD programme to complete your course.

Student are advised to get the acknowledgement/receipt while submitting Work Guide Report for **continuous evaluation** at Study Centre/Regional Centre concerned in order to get further information of his/her **terminal evaluation** of your practical course **OEEL-001** for the final submission of term end examination (TEE) evaluation marks. You are advised to be in touch with the programme incharge office of your concerned study centre .

We strongly feel that you should retain a photocopy of your complete work report file with all annexures duly acknowledged by the office of the Programme Incharge Study Centre/ Regional Centre to avoid any unforeseen situation.

For Formatting of Your Work Report

- **On the top of the first page of your Practical/ Inernship/Field Visit Work Assignment Guide Report Sheet**, please write the details exactly in the following format :

ENROLMENT NO. :	DATE: :
COURSE CODE : <u>(OEEL-001)</u>	COURSE TITLE : <u>PRACTICAL IN POWER DISTRIBUTION</u>
Study Centre Name and Code: -----	
Regional Centre Code:-----	
Student Name :-----	Address :-----
Signature :	E mail:
	Mobile No.:

- Please follow the format strictly to facilitate evaluation and avoid delay.
- Use only foolscap size writing paper (but not of very thin variety) for writing your responses.
- While submitting work report at study centre , clearly indicate and check work for submission of it in prescribed **proforma for activity report file and Annexure A and Annexure B**. Recheck your work before submitting it. Keep photocopy with you **duly acknowledged by the office of the Coordinator/ Study Centre/ Regional Centre to avoid any unforeseen situation.**

Wishing you all good luck!

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Printed at:

Dear Learner,

Welcome to this Course OEEL-001 titled "Practical in Power Distribution". This course requires you to have an real experience of demonstration/ practical exposure either at your study centre on the topics that have been highlighted in your course book/ relevant topics (see **Option I) or at any Substation /Power Distribution Company/ Relevant Electrical Industry or Training Centre (see **Option II**). Thus the learner is required to attempt/complete only one option that is either Option I or Option II below.**

(Option I)

Learner is strongly recommended that he/she shall be in constant touch with concern study centre/RC programme in-charge for the updates on schedule of practical activity and including examination /evaluation related activities of this practical course.

Programme Study Centres (PSC) premises or attached Work Centres arrange facilities for demonstration / practical exposure on:-

-Electric pole and fittings ;Cables -Overhead and Underground, cable jointing ; Transformers; Switch gears(includes fuses, switches, relays, isolators, circuit breaker, potential and current transformer, indicating device, lightning arresters, etc.) ;other Substation Equipment ; Earthing; Energy meters; Domestic Wiring Installations etc.

The activities that to be carried out at study centre where such facilities exists are from your **PRACTICAL MANUAL of course OEEL-001** and related Power distribution-**Substation Equipment**

- Erection of poles ,Fixing **different fittings on poles** such as cross-arms, **insulators**, stay-wire, guy rods/wires.
- Stringing and sagging in **overhead line conductors**.
- Jointing overhead line conductors.
- Installation of **overhead service line**.
- Identification of **cable jointing kits** and terminations.
- Earthing and Protection, measuring the earth resistance.
- Inspection and routine maintenance activity of a **transformer**.
- Trouble shooting and maintenance activity of **switch gears**.
- Installation and sealing of **energy meters**.
- Testing of **domestic wiring** installations. identification and location of various faults in house wiring and their rectification.

*Other practical activities may be taught to the learners as per industry need.

➤ **Evaluation (Assessment):**

For the above activities of 2-3 weeks the students **will be evaluated by the concern study centre** for their Guided (continuous) as well as unguided (terminal/Viva-voce) components. Students are strongly recommended that they shall be in constant touch with their study centre programme in-charge for the updates on schedule of practical activity and including examination /evaluation related activities of this practical course OEEL-001.

EVALUATION MARK SHEET

Continuous assessment (Guided component) Level 'A' Max. Marks:70	Terminal Assessment (Unguided Component) Level 'B' Max. Marks:30	TOTAL MARKS (Level 'A' + Level 'B') Max. Marks:100
<i>(PI/ Councillor of study centre to write marks as stated by Counsellor /Expert)</i>	<i>(PI/ Councillor of study centre to write marks as stated by Counsellor /Expert)</i>	(Add marks and write the total here)

Date:

Place:

(Signature of Examiner)

(Signature of Head of IGNOU StudyCentre With stamp)

Important:

In case at the assigned study centre/RC, the facilities to carry out the above listed activities (as mentioned in practical manual of course OEEL-001) being very limited/restricted/not available, the student is free to follow the option given below in Option II in place of Option I above.

(Option II)

Work Guide on Course Practical in Power Distribution-OEEL-001:

PRACTICAL TRAINING / INTERNSHIP/ FIELD VISIT –

Students can arrange Practical Training / Internship/ Field Visit of a minimum of 10 days duration on their own, at any Substation /Power Distribution Company / Relevant Electrical Industry / Training Centre/ Institution or Learner Support Cente.

Accordingly such students will be assessed for their performance by the Supervisor (Head / Manager /Incharge / Trainer or Counsellor) of concerned Substation /Power Distribution Company / Relevant Electrical Industry / Training Centre or Study Centre.

The Students will have to produce a report in the prescribed format at the study centre /online as may be directed. This will also form the part of their Guided (continuous) evaluation of this practical course.

Students will be evaluated by the concern study centre or as may be directed, for their Guided component (continuous evaluation) and unguided component (viva-voce) of this course.

- Students are strongly recommended that they shall be in constant touch with their study centre programme in-charge and online portal for the updates including examination /evaluation related activities of this practical course.

Cont.....

Dear Learner,

Welcome to this Course OEEL-001 titled "Practical in Power Distribution"

Work assignment on Practical Training / Internship/ Field Visit

requires you to have an real experience **at any Substation /Power Distribution Company / Relevant Electrical Industry or Training Centre** having facilities for demonstration / practical exposure on the some of the topics that have been highlighted in your course book / any other relevant topic on electrical power distribution as per industry need.

Practical Training / Internship/ Field Visit work emerges out of the theory syllabus. Doing this will help to clarify your understanding of theoretical concepts explained in this certificate programme.

For example exposure on **topics/activities related to**

- Electrical Power Substation or relevant electrical company infrastructure and functioning,
- Electric pole and fittings ; Overhead lines,
- Cables -overhead and underground, Cable jointing;
- Transformers;
- Switch gears (includes fuses, switches, relays, isolators, circuit breaker, potential and current transformer, indicating device, lightning arresters, etc.) ;other substation equipment ;
- Earthing (Pipe/Plate/Rod / strip earthing); electrical safety
- Energy meters; Domestic wiring installations, etc.

You should look for a Practical Training / Internship/ Field Visit opportunity to work on any above options. This will continue throughout the complete semester.

The brief activity/work Report has to be prepared as a separate file. **Enclosed Proforma of this will guide you to record activities.** In this activity report you have to write down the details of activities conducted during Practical Training / Internship/ Field Visit work .

Course Practical in Power Distribution (OEEL-001) is of total 100 Marks consists Guided component (continuous evaluation)-70 Marks and unguided component (terminal evaluation)-30 Marks

The Report has to be shown to your Supervisor under whom you have undertaken work at any Substation /Power Distribution Company / Relevant Electrical company, Industry/ Training Centre or Study Centre.

➤ **First level of evaluation** and is called
'**GUIDED COMPONENT (CONTINUOUS ASSESSMENT)**'

The **Supervisor (Head / Manager /Incharge / Trainer or Counsellor)** will evaluate your Report File after your Practical Training / Internship/ Field Visit.

This guided (continuous) assessment carries **70 per cent weight age.**

See **Annexure A).**

The Supervisor will give you marks and will certify that you undertook the Practical Training / Internship/ Field Visit and the report is the work done by the candidate. Look up the certificate copy attached at **Annexure A2** of this course manual.

You need to cut Annexure A, Annexure A2 and Annexure B from this manual and attach them in the beginning of the Practical Training / Internship/ Field Visit ,Activity Report Proforma File , before submitting your file to the Supervisor of (Substation /Power Distribution Company / Relevant Electrical company, Industry or Training/Study Centre) for evaluation.

➤ **The second level of evaluation is called**

UNGUIDED COMPONENT (TERMINAL ASSESSMENT)

- This internal assessment carries **30 percent weightage**.
- This will take place at your Study Centre/RC or online as may be directed after continuous evaluation.
- Do not forget to get your report certified from your Supervisor before submission for terminal /internal evaluation.

Note: Completion of this work assignment on **Course OEEL 001- Practical in Power Distribution** is mandatory for getting this Certificate. No request will be considered for waiver of the Practical Course.

We strongly feel that you should retain a photocopy of your activity report file and annexures duly acknowledged by the office of the Coordinator/ Study Centre to avoid any unforeseen situation.

Wishing you all good luck!

**Programme Coordinator
Certificate of Competency in Power Distribution**

(This activity report file with annexureA are to be submitted to your Practical Training / Internship/ Field Visit work Supervisor (Head / Manager /Incharge / Trainer or Counsellor) under whom you have undertaken work at any Substation /Power Distribution Company / Relevant Electrical Industry / Training or study Centre)

Cont.....

PRO FORMA FOR ACTIVITY REPORT FILE

Activity Report has to be prepared as a separate file. In this Report you have to write down the details of activities/work conducted during Practical Training / Internship/ Field Visit work, under different headings given in the Pro forma.

1. Student's Name:.....

2. Enrolment number:.....

3. Concern Study Centre and Regional Centre (Name and Code):

.....
.....

4. Kind of work undertaken by student (Tick any one):-

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Practical Training	Internship	Field Visit Work

4. Place of Work (Complete address):.....

.....
.....

5. Duration (Time Period):

.....

6. Role of Student at work place

- Trainee student / Intern / Employee

.....

Prepare a activity report describing the activities you worked on for the Practical Training / Internship/ Field Visit work .

(Optional: You may also enclose the pictures, illustrations, flow diagram, tables etc. , if required)

(contd....)

ACTIVITY REPORT FILE

S. No.	Daily Activity/Task Undertaken by Student	Date	Enclosure (if required)
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			

ANNEXURE A

Remember this Annexure has to be attached with the Activity Report file before it is submitted to your Supervisor. Keep a copy with yourself.

EVALUATION MARK SHEET

Guided component (Continuous assessment) - Level 'A'

Level 'A' - Evaluation by the Supervisor at the work place (Work place may be any Substation / Power Distribution Company / Relevant Electrical Company, Industry or Training Centre) This assessment carries 70% weightage (i.e it will be of Maximum 70 Marks).

The following is the format in which the Supervisor is requested to consolidate the marks for work. These marks should also be stated on the Activity Report. The Supervisor will also make her / his comments for the submission in the Report.

MAXIMUM MARKS 70

Name of Learner:		Enrolment number:	
S.No.	Particulars	Maximum Marks 70	Marks obtained
	how he / she performed the role given		
1	Activity Report of task undertaken	25	
2	Student's Performance	20	
3	Basic understanding of work undertaken	15	
6	Ability to Explanation	5	
7	Attention to details	5	
TOTAL MARKS OBTAINED IN FIGURES:			
TOTAL MARKS OBTAINED IN WORDS :			

Date:
Place:

(Signature of Supervisor with stamp)

**(Signature of Head of IGNOU Study Centre)
With stamp**

ANNEXURE A1 (Optional)

REVIEW OF THE LEARNER

This is a important part of **Practical Training/ Internship/ Field Visit Work**

to understand what the company/supervisor thinks of the learner. What are the learner's areas of strength and where does the learner need to work harder, etc.

Supervisor's Overall Comments about the Learner:

.....
.....

Date:

Place:

(Signature of Supervisor)

ANNEXURE A2

Remember this Annexure has to be attached with the Activity Report file before it is submitted to your Supervisor. Keep a copy with yourself.

***CERTIFICATE OF PRACTICAL TRAINING / INTERNSHIP/ FIELD VISIT
by SUPERVISOR***

We certify that the candidate

Mr./Mrs./Miss.....

Enrollment No. has undertaken the

Practical Training/Internship/ Field Visit Work

at.....

***(Name of Substation /Power Distribution Company / Relevant Electrical Company,
Industry or Training Centre)***

Under our guidance and supervision from to

***The activity report submitted herewith is the result of work undertaken by
the candidate.***

Date:

Place:

***Signature of Supervisor
Name and Designation with seal***

(contd....)

ANNEXURE 'B'

EVALUATION MARK SHEET

Unguided component (Terminal Assessment) – Level 'B'

Remember to photocopy this page and enclose this Annexure with the activity report File when you submit/mail it to IGNOU Programme In-charge/Counsellor at Study Centre. Keep a copy with yourself.

Level 'B' -Terminal Evaluation by IGNOU Expert at Study Centre/ headquarters.

The following is the format in which the Evaluation Expert at IGNOU will do the assessment of the learner. This assessment carries 30 % weightage (i.e it will be of Maximum 30 Marks). Following this the Expert of terminal evaluation is requested to consolidate the marks for Practical Training/Internship/ Field Visit Work as shown in the second table of this page. These marks should also be stated in the Activity Report

Maximum Marks 30

Name of Learner:		Enrolment number:	
S.No.	Particulars	Maximum Marks 30	Marks obtained
1	Details in Activity Report/ Viva- Voce	30	
TOTAL MARKS OBTAINED IN FIGURES:			
TOTAL MARKS OBTAINED IN WORDS :			

Marks Obtained by Learner for Level A and Level B of Evaluation for practical course to be consolidated by IGNOU Expert as follows

TOTAL MARKS OF FOR PRACTICAL COURSE (OEEL-001) (LEVEL A + LEVEL B)

MAXIMUM MARKS: 100

CONTINUOUS ASSESSMENT (Guided component) Max. Marks:70 Level 'A' <i>(Expert to write marks as stated by supervisor in Annexure 'A')</i>	TERMINAL ASSESSMENT (Unguided Component) Max. Marks:30 Level 'B' <i>(Expert to write marks given by her /him in Annexure 'B' above)</i>	TOTAL MARKS Max. Marks:100 (Level 'A' + Level 'B') (Expert to add marks and write the total here)

Date:

Place:

(Signature of Expert/Examiner)
