Government of India (Bharat Sarkar)
Ministry of Railways (Rail Mantralaya)
(Railway Board)

No. E(MPP)2019/3/44

RBE No. 10 /2020
New Delhi,Dated 27 .01.2020

The General Managers,
All Indian Railways/PUs,
Metro Railway/Kolkata
Railway Electrification/Allahabad
DG/RDSO/Lucknow
CAO/DMW/Patiala
CAO/COFMOW/New Delhi
ED/CAMTECH/Gwalior

DG/NAIR/Vadodara
The Directors,
IRITM/Lucknow
IRIEEN/Nasik
IRIMEE/Jamalpur
IRICEN/Pune
IRISET/Secunderabad

Sub: Revised Training Modules of Non-Gazetted Staff of Electrical Department.

Ref: Chairman/Railway Board's letter No. E(MPP)/2016/3/20 dated 28.11.2018 and Board's letter dated 06.12.2018

Vide Board (CRB) letter No. E(MPP)/2016/3/20 dated 28.11.2018, DG/NAIR had been authorized as the Head of the Academic Council of all CTIs to develop Training Modules of all categories of Non-Gazetted staff. Accordingly, training modules of Electrical Department was finalized and sent to this office.

2. Ministry of Railways (Railway Board) has reviewed the above Training Modules proposed and submitted by DG/NAIR. Board (MTR & MS) has approved the revised training modules.

3. The revised modules prepared have been scanned and uploaded under **E(MPP) Training Circulars** and can be viewed or downloaded from **railnet.**

4. General Manager shall identify the locations for conducting training of staff on the above revised modules in their respective Zones.

5. Kindly acknowledge receipt.

Jha

(Ajay Jha)
Joint Director/MPP
Railway Board.

No.E(MPP)2019/3/44 New Delhi, dated: 27-01-2020

Copy to:

1) The General Secretary, NFIR, 3 Chelmsford Road, New Delhi for information with 35 spares
2) The General Secretary, AIRF, 4 State Entry Road, New Delhi for information with 35 spares.
3) The Secretary General, FROA, R.No.256-A, Rail Bhavan, New Delhi for information with 5 spares.
4) The Secretary General, IRPOF, R.No.268, Rail Bhavan, New Delhi for information with 5 spares.
5) All Members, Department Council & Secretary Staff side National Council 13-C, Ferozeshah Road, New Delhi with 90 spares.
6) The Secretary General, AIRPF Association, Room No.256-D, Rail Bhavan, New Delhi with 5 spares.
7) General Secretary, All India SC & ST Railway Employees Association, 171/B-3, Basant Lane Railway Colony, New Delhi (15 copies).

For Secretary, Railway Board

No.E(MPP)2018/3/44 New Delhi, dated: 27-01.2020

Copy to:

i) PS & ED(PG) to MR, MSR(A) & MSR(K)
ii) PSO/Sr.PPS to CRB, FC, ML, ME, MM, MS, MT, DG(RHS) & DG(RPF)
iii) Sr.PPS/PPS/PS to AM(Budget), AM(CE), AM(C&IS), AM(Comml.), AM(Elect), AM(Fin), AM(Mech.), AM(Plg.), AM(Project), AM(PU), AM(Sig.), AM(Staff), AM(RS), AM(T&C), AM(Tele), AM(Traffic), AM(Works), Adv.L(RS), Adv(Vig.), Adv.Fin(Exp), Adv(IR), Adv(Safety), LA, OSD(MIS).
iv) ED(Plg.), ED(Accts.), EDF(BC), EDCE(B&S), EDCE(G), EDCE(Plg.), ED(CHG), ED(CC), ED(C&IS), ED(E&R), EDEE(Dev), EDEE(G), EDE, ED(RRB), EDE(N), EDE(Res), EDF, EDF€, EDF(S), EDF(B), EDF(RM), EDF(X)I, EDF(X)II, ED(H), EDLM, ED(MIS), EDE(GC), ED(T&MPP), EDME(Chg.), EDME(Fr.), EDME(Tr.), EDME(TOT), EDME(Dev.), EDME(W), ED(PC)I, ED(PC)II, ED(PP), ED(Project), ED(Project)/DMRC, EDRE, ED(Safety), JS, JS(C), JS€, JS(P), IG./RPF(Hqs), IG/RS, ED(S9g.), ED(Stat&Econ.), EDRS(C), EDRS(G), EDRS(P), EDRS(S), EDRS(W), ED(TD), EDTT(M), EDT(MC), EDT(P), ED(T&C), EDCE(P), ED(PM), ED(PG), EDTC-I, EDTC(FM), EDTT(F), EDTT(FM), EDTT(S), EDV(A), EDVE, EDV(T), ED(W).
v) Chief Commissioner of Railway Safety, Lucknow.
vi) E(Trg.), E(NG)I, E(NG)II, E(G), F(E)I, F(E)II, F(E)III, E(SCT)I, E(SCT)II branches of Railway Board.

भारत सरकार / रेल मंत्रालय
Govt. of India / Ministry of Railways
भारतीय रेल विद्युत इंजीनियरिंग संस्थान
Indian Railways Institute of Electrical Engineering (IRIEEN)
फोन - (0253) 2462545/546, 2407346,फैक्स -(0253) 2462548/2407313
रेलवे फोन : (011) 71399,71499 ई-मेल : admn2@irieen.railnet.gov.in
वैब साइट: www.irieen.indianrailways.gov.in
टीएमड्ब्लु कॉम्प्लेक्स एकलहरा रोड , नासिकरोड / TMW COMPLEX EAKLAHARE ROAD
NASIK ROAD 422101 / MAHARASHTRA

No.-NK/STC/IRIEEN/101-H/Policy DATE: -20.12.2019

To,
Director Electrical Engineering (Development),
Railway Board,
New Delhi.

Sub.:- Process Reforms in Training - Revision of Training Modules of non-gazetted staff of Electrical Dept.

Ref: - Your L.NO. E(MPP)/2019/3/44 Dated 11.11.2019.

With reference to above letter, complete self-contained training module for conducting training of non-gazetted staff of electrical department is attached herewith.

This is for your kind information and further necessary action.

(A.K.Mathur)
Dean/IRIEEN

Encl. : 1. Revised Training module for JE & SSE (Electrical)
2. Revised Training Module for Gr. C & D Electrical Staff (Other than JE/SSE)

Revised Training Module for JE & SSE (Electrical Dept.)

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1. Training Module For TRD Stream

Details and Sequence of Training Programme

Sr.No.	***Description***	***Duration in Weeks***	***Training Place***
1.	Joining formalities	**01**	Joining unit/ Division
2.	Phase I - Foundation Course (Common to All Streams)	**13**	IRIEEN/ Nominated ETC
3.	Field training	**03**	IRIEEN/ Nominated ETC Various field units like major Yards having different types of OHE/ OHE depots / Power supply installations / TPC / PSUs (BEML, BHEL, Larsen & Tubro, Alind, etc.)
4.	Phase-II Specialized Training Course in Traction Distribution	**08**	IRIEEN/ Nominated ETC
5.	General & Subsidiaries rules, Safety, First aid, Fire fighting & disaster management	**04**	Nominated ZRTI/ ETC
6.	Computer training	**02**	Nominated ETC/ outsourced Agency
7.	Familiarization with other departments (C & W, P-Way, S&T)	**02**	Nearby concerned units of division
8.	Attachment on the job experience	**14**	Field units where these JE/SSEs are finally to be posted
9.	Miscellaneous training	**03**	As per requirement by concerned division
10.	Presentation of project work	**01**	Divisional/ extra divisional field unit
11.	Yoga & Meditation	**--**	As per Railway Board Letter RBE 64/2015
12.	Posting examination	**01**	Divisional/ extra divisional field unit
	Total duration	**52**	

Initial Training Course for JE/SSE (Common to All Streams)

Discipline – Electrical Traction Distribution.

Duration – 52 Weeks

		Duration
Duration	**1. JOINING FORMALITIES**	**1 Week**
Place	**Division / Joining unit**	
	2. PHASE I	
	FOUNDATION COURSE (FC) (***Common to all streams of Electrical Engineering***)	
Duration		**13 Weeks**
Place	**IRIEEN / Nominated Electrical Training Centre**	
Module No.	***Brief Description***	***Duration***
FC 01	**Introduction to working of Railway organization and electrical department set up, functions of various streams**	**4 Days**
	Registration formalities	
a)	General introduction to Indian Railways – Brief History, salient features.	
b)	Organizational structure - Railway administration/ Railway Board setup, Zonal setup, Divisional setup.	
c)	Introduction to Electrical Department- organizational structure, functions, role of electrical department in railway working etc.	
d)	Various units of railways, major workshops, production units, RDSO etc.	
e)	Duties of JE/ SSEs.	
FC 02	**Instrumentation**	**8 Days**
a)	Basic concepts of Condition Monitoring of electrical equipment,	
b)	Condition monitoring techniques	
	• DC tests - Insulation Resistance, Polarization Index etc.	
	• AC tests - Capacitance measurement, tan delta, Partial discharge, surge comparison test etc.	
c)	Condition monitoring of transformers - Theory and practice of Dissolved Gas Analysis (DGA), BDV etc.	
d)	Introduction of power cables	
e)	Non-destructive testing techniques in various functions of electrical department like visual testing, Dye penetrate testing, Magnetic Particle testing, eddy current testing and ultrasonic testing	

Module No.	*Brief Description*	*Duration*
FC 03	**Basic Electrical & Electronics**	**6 Days**
a)	Various terms, units, theory of passive components – L,C,R, basic principles of electricity and Electromagnetic induction and various laws i.e. Ohm's law, Kirchoff's law, etc	
b)	Classification of electronic components, Active Components – semiconductor physics, construction and operating principle,	
c)	Brief on Power Diodes, Zener Diodes, LEDs, BJTs, UJT, MOSFET, SCR, GTO and IGBT etc.	
d)	**Practical work on** – oscilloscopes, testing of passive electronic components, Testing of active components	
FC 04	**Power Electronics**	**08 Days**
a)	Control of 3 phase drives— Variable Voltage Variable	
b)	Frequency (VVVF) drives,	
c)	Overview of power electronics in 3 phase locomotives,	
d)	Static Inverter (SI Unit) and	
e)	AC Coach Inverter Unit.	
FC 05	**Welding Technology**	**02 Days**
a)	Basics of welding, , various types of welding techniques, gas and arc welding, gas cutting etc. and application of welding.	
b)	Safety during welding and gas cutting.	
c)	Checking of weld joints and defect prevention	
d)	Classification, properties and selection of electrodes.	
FC 06	**Engineering Materials and Metallurgy**	**04 Days**
a)	Ferrous and non- ferrous metals used in Railways,	
b)	Brief on Heat treatment processes, Induction heating,	
c)	Brief on metal wear and lubrication,	
d)	Plain and roller bearings — theory, application, selection, maintenance and precautions,	
e)	Lubricants specifications, properties and selection,	
f)	Rubber components specifications and storage,	
g)	Electrolytic copper	

Module No.	*Brief Description*	*Duration*
FC 07	**Managerial Skills**	**05 Days**
a)	Aspects of leadership, leadership theory and evolution,	
b)	Leadership v/s management,	
c)	Role of supervisors in providing effective leadership.	
d)	Improving Communication, written and verbal, explain the purpose of communication, communication process, barriers to effective communication, ways to improve communication skills – writing, reading, speaking and listening.	
e)	Basic in change management/ behaviour management.	
f)	Team work, Importance of team work in organisations particularly in Railways, how to become a better team player.	
g)	Time management, stress management, interactive exercises in team work, games and activities.	
h)	Customer Satisfaction. Thinking from customer point of view– what are their needs/expectations and how can we best serve our customers.	
i)	Positive Attitude	
j)	Values in Administration	
k)	Soft skill & Ethics	
FC 08	**Material Management (Stores, Store procurement, records, inventory management)**	**06 Days**
a)	Introduction to material management.	
b)	Organization structure of material management organisation of Indian Railways,	
c)	Functions of material management — Planning and inventory Management (Stock items, PL no. & non stock items), purchase, Receipt and Inspection	
d)	Stocking and preservation, Periodic checking of stores, stock verification etc.	
e)	Distribution	
f)	Scrap disposal	
g)	DOs and Don'ts	
h)	**E- T**endering, **GEM** procurement & **GST** as in force in Rlys	

Module No.	*Brief Description*	*Duration*
FC 09	**Establishment & Industrial Management (DAR, Leave and pass rules)**	**6 Days**
a)	Rules relating to leave, passes, travel on duty	
b)	Railway accommodation and Staff Welfare.	
c)	Industrial relations and role of trade unions.	
d)	Discipline and Appeal Rules,	
e)	Conduct Rules.	
f)	Basics of RTI and Disabilities Acts and our obligations and Responsibilities.	
g)	Labour Laws and hours of employment rules (HOER)	
h)	Rajbhasha	
i)	Establishment powers of JE & SSE in open line.	
FC 10	**Contract Management & Financial management**	**6 Days**
	Contract Management	
a)	Tenders & Contracts	
b)	Vigilance	
	Financial Management	
c)	(Railway Accounting and Financing Procedures)	
d)	Primary units, various demands	
e)	Works programme, M&P and RS programme	
f)	Imprest management	
g)	Stages of budgeting (Revised and Budget Estimates, August Review, Final Modification)	
h)	Role of JE & SSE in Tenders & Contracts.	
FC 11	**Familiarisation with all streams of electrical Engineering in Railways**	**09 Days**
a)	Familiarization with TRS, TRD, General Services (TL & AC and Power supply).	
b)	Brief introduction of equipment and their functions of	
	i. Electric loco conventional & three phase.	
	ii. EMU/MEMU conventional & three phase.	
	iii. TrD – OHE/ PSI/ RC	
	iv. General services power supply installations.	
	v. Coaching train lighting & air conditioning.	
c)	Periodicity of maintenance schedules of various assets:	
	i. Electric loco conventional & three phase.	
	ii. EMU/MEMU conventional & three phase.	
	iii. TrD – OHE/ PSI/ RC	
	iv. General services power supply installations.	
	v. Coaching train lighting & air conditioning.	
d)	Electrical inspector general (EIG) related activities.	
e)	Overview of Codes, manuals and other publications of electrical department issued by Railway board, RDSO etc.- These topics are to be covered in library by studying available Hard / soft copies.	
f)	Energy Conservation - Solar energy, wind energy etc.	
g)	Visits to various nearby installations of TRD, TL/AC, Loco,	
h)	EMU and general power supply installations.	

Module No.	*Brief Description*	*Duration*
FC 12	**IE Rules and Energy Conservation**	**04 Days**
i)	Brief on I.E. Rules, Energy Conservation Act, BEE	
j)	Codes, ECBC Code, Information on star rated products,	
k)	Brief on clean development mechanism and carbon credits	
l)	Solar lights, design, installation and maintenance	
m)	Energy efficiency measures in Electrical assets	
Module No.	***Brief Description*** ***To make familiar with the working of other departments.***	***Duration/ Venue***
New OD	**Attachment to following shall be made for making familiarization with Other Departments to understand their Working and joint official procedure.**	06 Days
a)	Working of control office/ TPC/ TLC.	Control office
b)	P-Way maintenance/ assets	P.Way Depot/ site
c)	Sick lines, C&W depot/ activities	Sick lines, C&W Depots
d)	Signalling/ RRI working	Signalling/RRI Depot
Module No.	***Brief Description***	
PFGD	**Presentation feedback & group discussions**	**04 Days**
	Examination/ Viva voice	
	(*Topic for presentation will be assigned by IRIEEN/ ETC in groups*)	
PHASE I	**TOTAL DURATION**	**13 WEEKS**

Module No.	*Brief Description*	*Duration*
	3. FIELD TRAINING (***Trips will be conducted Stream wise by IRIEEN/ ETCs under their control.***)	
Duration		**03 Weeks**
Place	**Various field units like Major Yards having different types of OHE / OHE depots / Power supply installations/ PSUs (BHEL/ BEML/ L&T/ALLIND etc.), Construction sites of Railways.**	
Module No.	*Brief Description*	
FT	Between the two phases of institutional training.	
➢	Trainee JE/ SSE should be sent for field training/ field visits, wherein they should be given exposure to practical work processes at various field units.	
➢	The field unit may be Major Yards having different types of OHE/ Power supply installations/ PSUs (BHEL/ BEML/ L&T/ ALLIND etc.)/ Construction sites of railways.	
➢	The object of this training is to familiarise the trainee with the actual assets & their equipment, their manufacturing/ assembling processes so that they can visualise the things during their specialised training.	

	4. PHASE II ***Specialised Training Course in Traction Distribution***	
Duration	**08 Weeks**	
Place	**IRIEEN / Nominated Electrical Training Centre**	
Module No.	***Brief Description***	***Duration***
STC-TRD-01	**General Description of Fixed Installations**	3 days
a)	Power supply arrangements at sub-station	
b)	Power supply for signalling	
c)	Remote control and communication arrangements	
d)	Overhead Equipment	
e)	Special Warning Signals	
STC-TRD-02	**Overhead Equipment - I**	6 days
a)	Duties of SSE and JE (OHE)	
b)	Foundations for OHE Structures	
c)	OHE Structures	
d)	Cantilever Assembly	
e)	Regulating Equipment	
f)	Section Insulator	
g)	Isolators	
h)	Droppers	
i)	Neutral Section	
j)	Conductors	
k)	Tension length	
l)	Overlap	
m)	Jumpers	
n)	Contact wire height	
o)	Stagger	
p)	Encumbrance	
q)	Span Length	
r)	Implantation/Setting Distance	
s)	Turnout and Crossover	
t)	Clearances	
u)	Bonding and Earthing	
v)	Principles of sectioning & Numbering Scheme	
STC-TRD-03	**Over Head Equipment - II**	6 days
a)	Maintenance schedule for overhead equipment.	
b)	Tower wagon operation, maintenance and safety while working.	
c)	Safety rules for OHE	
d)	Current collection test (OLIVER-G)	

Module No.	*Brief Description*	*Duration*
STC-TRD-04	**Power Supply Installations - I**	6 days
a)	Duties of SSE and JE (PSI)	
b)	Traction Power Transformers	
c)	Circuit breaker, Interruptor and Isolator	
d)	Auxiliary Transformer	
e)	Current Transformer	
f)	Potential Transformer	
g)	Lighting Arrestor	
h)	Capacitor Bank	
i)	Bonding and Earthing	
j)	Batteries and Battery chargers	
k)	Numbering Scheme in PSI	
STC-TRD-05	**Power Supply Installations - II**	6 days
a)	Protective system and Relay setting calculations.	
b)	Maintenance Schedule for power supply installations.	
c)	Energy conservation measures for Traction installations	
d)	Safety during working at power supply installations	
e)	Uses of Thermo Vision Camera	
STC-TRD-06	**2X25 kV ac Traction System**	3 days
a)	Introduction and description of 2X25kV ac Traction System	
STC-TRD-07	**Remote Control and SCADA system**	3 days
a)	Introduction	
b)	Duties of SSE and JE (RC)	
c)	Salient features of SACDA	
d)	System Description	
STC-TRD-08	**Traction Power Control**	3 days
a)	Operation	
b)	Duties of CTPC and TPC	
c)	Power blocks and PTW	
d)	Joint procedure order	
e)	Open Access	
STC-TRD-09	**Breakdown and Electrical accidents**	3 days
a)	Sub-station and switching station breakdown	
b)	Breakdown of RC equipment	
c)	OHE breakdown	
d)	Electrical accidents	
e)	Emergency stores and breakdown equipment	

STC-TRD-10	Railway Electrification	3 days
a)	Introduction	
b)	Survey Team & its work.	
c)	Abstract Estimate and Cost Benefit Analysis	
d)	Format of the project report	
e)	Commissioning of Electrical Installations and EIG Sanction	
STC-TRD-11	Safety precautions on electrified section	3 days
a)	Station working rules	
b)	Induction effects of 25kV ac 50Hz Single Phase Traction	
c)	Working of steam and diesel locomotives in electrified section	
d)	Loading and unloading of petroleum products	
e)	Rules applicable to Permanent Way Staff	
f)	Rules for S&T installations	
g)	Over-dimensioned consignments	
h)	Competency certificates	
i)	Others precautions	
j)	Regulations for Power Line Crossings of railway Tracks	
f)	Typical case studies.	
PFGD	**Presentation feedback & group discussions Examination/ Viva voice**	3 days
	(***Topic for presentation will be assigned by CETI/ ETC in groups***)	
PHASE II	**TOTAL DURATION**	**08 WEEKS**

	5. GENERAL AND SUBSIDIARY RULES, SAFETY, FIRST AID, FIRE FIGHTING & DISASTER MANAGEMENT **(*Common to all streams of Electrical Engineering*)**	
Duration	**04Weeks**	
Place	**Nominated ZRTI/ ETC**	
Module No.	***Brief Description***	***Duration***
GEN-01	**General and Subsidiary Rules**	12 Days
	The course content for General and Subsidiary Rules training for electrical supervisors would be developed by respective ZRTIs. This course shall be conducted before sending trainee JE/SSE for attachment/on the job experience.	
	(Ref: RBE No.11/2009, letter No. E(MPP)/2009/3/16, New Delhi, dated 15 -01-2010)	
GEN-02	**Safety & Electrical accidents**	3 Days
a)	General safety rules, Importance of safety belts, helmets, ladders.	
b)	Preventive measures to avoid electrical accidents	
c)	Measures to be taken in case of electrical accident.	
d)	Case studies and discussion	
GEN-03	**Safety in electrified sections**	3 Days
a)	Induction effect on the nearby LT lines and yard lighting mains.	
b)	Safety precautions to be taken for PF shelters, fencing, FOBs, while working of cranes in the vicinity of OHE. etc.	
c)	Operation and Importance of locking of isolating switches of OHE	
d)	Importance of permit to work, earthing & bonding, temporary jumpering of rails in case of rail fracture.	
e)	Case studies and discussion	
GEN 04	**First Aid and Fire Fighting**	**3 Days**
a)	Types of Fire extinguishers, their application, methods of fire fighting.	
b)	Electrical shock treatment measures.	
c)	First aid for injury, burns	
d)	Audio/ Visual/ live demonstration of fire fighting and first aid.	
GEN 05	**Disaster Management**	**3 Days**
	Introduction to Disaster management.	
	Organizational infrastructure to effectively combat disaster (medical accessories, relief train, essential materials).	
	Break down management, preventive steps.	
	Analysis of breakdowns, case studies and discussion	

	6. COMPUTER TRAINING (*Common to all streams of Electrical Engineering*)	
Duration	**02 Weeks**	
Place	**Any Computer institute/ outsourced agency or Nominated ETC.**	
Module No.	***Brief Description***	***Duration***
CT 01	**Computer training**	02 Weeks
a)	Theory and practical to gain proficiency in MS Office – Word, excel and power point, e-mail and web browsing.	

	7. FAMILIARIZATION WITH OTHER DEPARTMENTS (C&W, P-WAY & S&T) (*Common to all streams of Electrical Engineering*)	
Duration	**02 Weeks**	
Place	**Nearby concerned units of division** ***To make familiar with the working of other departments.***	
Module No.	***Brief Description***	***Duration***
OD 01	**Attachment to following shall be made for making familiarization with other Departments to understand their working and joint official procedure.**	02 weeks
a)	Working of control office/ TPC/ TLC.	Control office
b)	P-Way maintenance/ assets	P.Way Depot/ site
c)	Sick lines, C&W depot/ activities	Sick lines, C&W Depots
d)	Signalling/ RRI working	Signalling/RRI Depot

	08. ATTACHMENT ON THE JOB EXPERIENCE (Only For TRD Stream)	
Duration	**14 Weeks**	
Place	**Allocated field unit where the trainee JE/SSE finally to be posted.**	
Module No.	***Brief Description***	***Duration***
Job Experience	Final phase of training shall comprise of on the job attachment wherein after completion of institutional and field training, the trainee JE/ SSEs shall be posted in the field units allocated to them by the concerned Railways.	14 Weeks
a)		
b)	During this period, the trainees would perform like a supervisor working on an active assignment but would not be given independent charge.	
c)	During this period, the trainees shall go through different technician training modules to understand the basic maintenance techniques.	

d)	The programme for this attachment/on the job experience would be framed by the Officer in charge of the Division/extra Divisional Field Units where these JE/ SSEs are to be finally posted.	
e)	During this period training in TPC, OHE depot, PSI depot (minimum 1 week at each place)	
f)	During this training trainee shall select current problem, study and prepare a project report containing details and probable causes and solutions. This should be shown during presentation before final exam**.** **(item no. 10 given below)**	

	09. MISCELLANEOUS TRAINING	
Duration	**03 Weeks**	
Place	**As per requirement in division.**	
Module No.	***Brief Description***	***Duration***
MT	Case studies of identified problems, promoting innovative ideas of trainees shall be explored during this period.	**03 weeks**
	Any training which is left over or required for the job of JE/SSE may be framed by officer in charge of divisional/ extra divisional field units.	
	For example If a JE or SSE is to work in OHE/PSI depot, he should visit major OHE/PSI depots of division to observe different working techniques used, he should also visit any Railway Electrification construction site nearby.	

	10. PRESENTATION OF PROJECT WORK	
Duration	**01 Weeks**	
Place	**Divisional / extra divisional field units**	
Module No.	***Brief Description***	***Duration***
PW	During attachment **on the job experience training (duration 14 weeks)**, trainee shall select a current problem, study and prepare a project report containing details and probable causes and solutions.	**01 Week**
	This report shall be presented during session including all trainees so as to develop the communication and presentation skills.	

	11. YOGA & MEDITATION	
Module No.	***Brief Description***	***Duration***
YM	Mandatory **"Yoga training"** as per Railway Board's circular no. **RBE No. 64/2015** circulated vide Railway Board's letter no. E (MPP)2015/3/10 New Delhi dated 15.06.2015, shall be provided to all trainees. The copy of referred letter is enclosed as Annexure-I.	**During phase I & Phase II**
Place	IRIEEN	

	12. POSTING EXAMINATION	
Duration	**01 Week**	
Place	**Concerned Division where he/she will be posted.**	

Total Duration = 52 week

1.Training Module For TRS (Loco & EMU) Stream

Details and Sequence of Training Programme

Sr.No.	*Description*	*Duration*	*Training Place*
1.	Joining formalities	**01**	Division/ Joining unit
2.	Phase I - Foundation Course (Common to All Streams)	**13**	IRIEEN/ Nominated ETC
3.	Field training	**03**	IRIEEN/ Nominated ETC
			Various field units like major Yards having different types of OHE/ OHE depots / Power supply installations / TPC / PSUs (BEML, BHEL, Larsen & Tubro, Alind, etc.)
4.	Phase-II Specialized Training Course in Traction Distribution	**08**	IRIEEN/ Nominated ETC
5.	General & Subsidiaries rules, Safety, First aid, Fire fighting & disaster management	**04**	Nominated ZRTI/ ETC
6.	Computer training	**02**	Nominated ETC/ outsourced Agency
7.	Familiarization with other departments (C & W, P-Way, S&T)	**02**	Nearby concerned units of division
8.	Attachment on the job experience	**14**	Field units where these JE/SSEs are finally to be posted
9.	Miscellaneous training	**03**	As per requirement by concerned division
10.	Presentation of project work	**01**	Divisional/ extra divisional field unit
11.	Yoga & Meditation	**--**	As per Railway Board Letter RBE 64/2015
12.	Posting examination	**01**	Divisional/ extra divisional field unit
	Total duration	**52**	

Initial Training Course for JE/SSE (Common to All Streams)

Discipline – Electrical TRS & EMU

Duration – 52 Weeks

		Duration
	1. JOINING FORMALITIES	**1 Week**
Place	**Division / Joining unit**	
	2. PHASE I	
	FOUNDATION COURSE (FC) (***Common to all streams of Electrical Engineering***)	
Duration		**13 Weeks**
Place	**IRIEEN / Nominated Electrical Training Centre**	
Module No.	***Brief Description***	***Duration***
FC 01	**Introduction to working of Railway organization and electrical department set up, functions of various streams**	**4 Days**
	Registration formalities	
a)	General introduction to Indian Railways – Brief History, salient features.	
b)	Organizational structure - Railway administration/ Railway Board setup, Zonal setup, Divisional setup .	
c)	Introduction to Electrical Department- organizational structure, functions, role of electrical department in railway working etc.	
d)	Various units of railways, major workshops, production units, RDSO etc.	
e)	Duties of JE/ SSEs.	
FC 02	**Instrumentation**	**8 Days**
a)	Basic concepts of Condition Monitoring of electrical equipment,	
b)	Condition monitoring techniques	
	• DC tests - Insulation Resistance, Polarization Index etc.	
	• AC tests - Capacitance measurement, tan delta, Partial discharge, surge comparison test etc.	
c)	Condition monitoring of transformers - Theory and practice of Dissolved Gas Analysis (DGA), BDV etc.	
d)	Introduction of power cables	
e)	Non-destructive testing techniques in various functions of electrical department like visual testing, Dye penetrate testing, Magnetic Particle testing, eddy current testing and ultrasonic testing	

Module No.	*Brief Description*	*Duration*
FC 03	**Basic Electrical & Electronics**	**6 Days**
a)	Various terms, units, theory of passive components – L,C,R, basic principles of electricity and Electromagnetic induction and various laws i.e. Ohm's law, Kirchoff's law, etc	
b)	Classification of electronic components, Active Components – semiconductor physics, construction and operating principle,	
c)	Brief on Power Diodes, Zener Diodes, LEDs, BJTs, UJT, MOSFET, SCR, GTO and IGBT etc.	
d)	**Practical work on** – oscilloscopes, testing of passive electronic components, Testing of active components	
FC 04	**Power Electronics**	**08 Days**
f)	Control of 3 phase drives— Variable Voltage Variable	
g)	Frequency (VVVF) drives,	
h)	Overview of power electronics in 3 phase locomotives,	
i)	Static Inverter (SI Unit) and	
j)	AC Coach Inverter Unit.	
FC 05	**Welding Technology**	**02 Days**
e)	Basics of welding, , various types of welding techniques, gas and arc welding, gas cutting etc. and application of welding.	
f)	Safety during welding and gas cutting.	
g)	Checking of weld joints and defect prevention	
h)	Classification, properties and selection of electrodes.	
FC 06	**Engineering Materials and Metallurgy**	**04 Days**
h)	Ferrous and nonferrous metals used in Railways,	
i)	Brief on Heat treatment processes, Induction heating,	
j)	Brief on metal wear and lubrication,	
k)	Plain and roller bearings — theory, application, selection, maintenance and precautions,	
l)	Lubricants specifications, properties and selection,	
m)	Rubber components specifications and storage,	
n)	Electrolytic copper	

Module No.	*Brief Description*	*Duration*
FC 07	**Managerial Skills**	**05 Days**
l)	Aspects of leadership, leadership theory and evolution,	
m)	Leadership v/s management,	
n)	Role of supervisors in providing effective leadership.	
o)	Improving Communication, written and verbal, explain the purpose of communication, communication process, barriers to effective communication, ways to improve communication skills – writing, reading, speaking and listening.	
p)	Basic in change management/ behaviour management.	
q)	Team work, Importance of team work in organisations particularly in Railways, how to become a better team player.	
r)	Time management, stress management, interactive exercises in team work, games and activities.	
s)	Customer Satisfaction. Thinking from customer point of view – what are their needs/expectations and how can we best serve our customers.	
t)	Positive Attitude	
u)	Values in Administration	
v)	Soft skill & Ethics	
FC 08	**Material Management (Stores, Store procurement, records, inventory management)**	**06 Days**
i)	Introduction to material management.	
j)	Organization structure of material management organisation of Indian Railways,	
k)	Functions of material management — Planning and inventor management (Stock items, PL no. & non stock items), purchase, Receipt and Inspection	
l)	Stocking and preservation, Periodic checking of stores, stock verification etc.	
m)	Distribution	
n)	Scrap disposal	
o)	DOs and Don'ts	
p)	**E- T**endering, **GEM** procurement & **GST** as in force in Rlys	

Module No.	*Brief Description*	*Duration*
FC 09	**Establishment & Industrial Management (DAR, Leave and pass rules)**	**6 Days**
j)	Rules relating to leave, passes, travel on duty	
k)	Railway accommodation and Staff Welfare.	
l)	Industrial relations and role of trade unions.	
m)	Discipline and Appeal Rules,	
n)	Conduct Rules.	
o)	Basics of RTI and Disabilities Acts and our obligations and responsibilities.	
p)	Labour Laws and hours of employment rules (HOER)	
q)	Rajbhasha	
r)	Establishment powers of JE & SSE in open line.	
FC 10	**Contract Management & Financial management**	**6 Days**
	Contract Management	
i)	Tenders & Contracts	
j)	Vigilance	
	Financial Management	
k)	(Railway Accounting and Financing Procedures)	
l)	Primary units, various demands	
m)	Works programme, M&P and RS programme	
n)	Imprest management	
o)	Stages of budgeting (Revised and Budget Estimates, August Review, Final Modification)	
p)	Role of JE & SSE in Tenders & Contracts.	
FC 11	**Familiarisation with all streams of electrical Engineering in Railways**	**09 Days**
n)	Familiarization with TRS, TRD, General Services (TL & AC and Power supply).	
o)	Brief introduction of equipment and their functions of	
	vi. Electric loco conventional & three phase.	
	vii. EMU/MEMU conventional & three phase.	
	viii. TrD – OHE/ PSI/ RC	
	ix. General services power supply installations.	
	x. Coaching train lighting & air conditioning.	
p)	Periodicity of maintenance schedules of various assets:	
	vi. Electric loco conventional & three phase.	
	vii. EMU/MEMU conventional & three phase.	
	viii. TrD – OHE/ PSI/ RC	
	ix. General services power supply installations.	
	x. Coaching train lighting & air conditioning.	
q)	Electrical inspector general (EIG) related activities.	
r)	Overview of Codes, manuals and other publications of electrical department issued by Railway board, RDSO etc.- These topics are to be covered in library by studying available hard/soft copies.	
s)	Energy Conservation - Solar energy, wind energy etc.	
t)	Visits to various nearby installations of TRD, TL/AC, Loco,	
u)	EMU and general power supply installations.	

Module No.	*Brief Description*	*Duration*
FC 12	**IE Rules and Energy Conservation**	**04 Days**
v)	Brief on I.E. Rules, Energy Conservation Act, BEE	
w)	Codes, ECBC Code, Information on star rated products,	
x)	Brief on clean development mechanism and carbon credits	
y)	Solar lights, design, installation and maintenance	
z)	Energy efficiency measures in Electrical assets	
Module No.	***Brief Description*** ***To make familiar with the working of other departments.***	***Duration/ Venue***
New OD	**Attachment to following shall be made for making familiarization with Other Departments to understand their Working and joint official procedure.**	06 Days
e)	Working of control office/ TPC/ TLC.	Control office
f)	P-Way maintenance/ assets	P.Way Depot/ site
g)	Sick lines, C&W depot/ activities	Sick lines, C&W Depots
h)	Signalling/ RRI working	Signalling/R RI Depot
Module No.	*Brief Description*	*Duration*
PFGD	**Presentation feedback & group discussions**	**04 Days**
	Examination/ Viva voice	
	(*Topic for presentation will be assigned by CETI/ ETC in groups*)	
PHASE I	**TOTAL DURATION**	**13 WEEKS**

	3. FIELD TRAINING **(*Trips will be conducted Stream wise by CETI/ ETCs under their control.*)**	
Duration	**03 Weeks**	
Place	**Various field unit may be CLW, Electric Locomotive Workshop having different types of Electric Locos / Electric Loco Sheds/ Trip Sheds/ PSUs (like BHEL, CGL, Hind Rectifier, BTIPL, ABB, Simplex Casting Ltd. Raipur, VED Sassomeccanica India Pvt .Ltd. Kanpur, etc.)**	
Module No.	*Brief Description*	*Duration*
FT	Between the two phases of institutional training.	3 Weeks
➢	Trainee JE/ SSE should be sent for field training/ field visits, wherein they should be given exposure to practical work processes at various field units.	
➢	The field unit may be CLW, Electric Locomotive Workshop having different types of Electric Locos / Electric Loco Sheds/ Trip Sheds/ PSUs (like BHEL, CGL, Hind Rectifier, BTIPL, ABB, Simplex Casting Ltd. Raipur, VED Sassomeccanica India Pvt. Ltd. Kanpur, etc.).	
➢	The object of this training is to familiarise the trainee with the actual assets & their equipment, their manufacturing/ assembling processes so that they can visualise the things during their specialised training	

TRS & EMU STREAM- Phase -II

Duration	**8 Weeks**	
Place	**IRIEEN / Nominated Electrical Training Centre**	
	PHASE II	
	Specialised Training Course (STC) in Traction Rolling Stock (TRS)/ Loco/EMU/MEMU	
Part I	**Conventional AC Electric Locomotives /EMU/MEMU**	
Module No.	***Brief Description***	***Duration***
STC-TRS-CON-01	**INTRODUCTION OF CONVENTIONAL AC ELECTRIC LOCOMOTIVE/EMU/MEMU**	**6 Days**
a)	Basic features of electric locomotive	
b)	Power circuit diagrams of AC electric locomotive	
c)	Control circuit diagrams of AC electric locomotive	
d)	Pneumatic circuit diagrams of AC electric locomotive (Air brake)	
e)	Maintenance schedule periodicity of Ac electric locomotive	
f)	Brief on Major / Minor maintenance schedules of electric loco	
STC-TRS-CON-02	**DETAIL OF ELECTRICAL EQUIPMENT OF AC ELECTRIC CONVENTIONAL LOCOMOTIVE/EMU/MEMU**	**6 Days**
a)	Traction motor	
b)	Transformer	
c)	GR	
d)	SMGR	
e)	Auxiliary motors with blower	
f)	Vacuum circuit breaker	
g)	EMC	
h)	EPC	
i)	Relays & switches	
j)	RSI	
k)	SI Unit	
l)	BA Panel	
m)	SL & SJ	
n)	RC Network	
o)	Driver Desk with MP	
p)	Light fittings & Loco fuses	
q)	Relevant SMIs/ MS and TCs	
r)	SIV, DPWS, VCD, AWS	

Module No.	*Brief Description*	*Duration*
STC-TRS-CON-03	**DETAIL OF MECHANICAL EQUIPMENT OF AC ELECTRIC CONVENTIONAL LOCO MOTIVE/EMU/MEMU**	**3 Days**
a)	Bogie	
b)	Wheel & Gears	
c)	Axle Box	
d)	MSU/Suspension Bearing	
e)	Springs snubbers	
f)	Brake Equipment (Brake rigging)	
STC-TRS-CON-04	**DETAIL OF PNEUMATIC EQUIPMENT OF AC ELECTRIC CONVENTIONAL LOCO MOTIVE /EMU/MEMU (Newly Added)**	**3 Days**
1.	Pneumatic Valve	
2.	Pneumatic Panels	
3.	Pneumatic Filters	
4.	Air dryers	
5.	Pantograph	
6.	Wipers	
7.	Horns	
8.	Relevant SMIs/ MS and TCs	
9.	Special tools and Devices gadgets	
10.	Air Spring	
STC-TRS-CON-05	**TESTING OF LOCOMOTIVE/EMU/MEMU**	**6 Days**
a)	Testing of various Electrical equipment of Locomotive	
b)	Testing of Pneumatic circuit of Locomotive	
c)	LT testing	
d)	HT testing	
e)	Various precautions such as –	
f)	i. Pre monsoon precaution ii. Pre summer precaution iii. Pre winter precaution etc	
g)	Loco log book, history book and their importance	
h)	Miscellaneous Items	
i)	• Energy conservation in Loco • Fire prevention in Loco • Wheel skidding • Safety in shed	

	***Part II - Three Phase AC Electric Locomotives (3ϕ)*/EMU/MEMU**	
Module No.	***Brief Description***	***Duration***
STC-TRS-3ϕ - 1	**INTRODUCTION OF THREE PHASE LOCOMOTIVE/EMU/MEMU**	**6 Days**
1.	***Brief description of three phase loco*** a) Technical data b) Electrical features c) Mechanical features	
2.	***Braking concept over view (pneumatic brake system)***	
3.	***Driving***	
4.	***Traction equipment and their circuit*** (TFP, Convertor, Line Contractor, DC Link, TM, etc.)	
5.	***Auxiliary circuit equipment and their circuit*** a) Main compressor b) Ventilation (blower) c) Scavenge blower d) Cooling concept (Oil pumps)	
6.	***Control circuit***	
7.	***Control Electronics*** a) Bus concept b) Bus station c) Third party control electronics	
8.	***Safety system*** a) Vigilance control module b) Fire deduction system c) Fire extinguishers	
9.	***Comfort equipment (Ventilation/heating)*** a) Fan b) Cab ventilation/heating (Re-circulating air blowers) c) Force ventilation	
10.	***Viper/washer unit***	
11.	***Brief on Protection concept*** a) Interlocking concept b) Protective measures c) Disturbance with VCB d) Traction interlocks e) Start/running interlocks f) Catenary voltage g) Transformer h) Line contactors i) Traction motor j) Auxiliary converters (BUR) k) Oil pumps and fans l) Battery m) Controls electronics n) Train bus o) VCB p) Convertor q) Software	

	r) Cell temperature s) Speed sensor on TM t) Harmonic filter circuit ***u)*** Redundancy	
Module No.	***Brief Description***	***Duration***
STC-TRS-3ϕ - 2	6. ***Over view driver's cabs***	**6 Days**
	7. ***Operating concept*** a) Control Panel A b) Control Panel B c) Control Panel C d) Control Panel D e) Panel D f) Wind shield wiper g) Comfort equipment h) Detail layout of light switch and sockets in driver cab i) Detail layout of light switch and sockets in machine room j) Auxiliary circuit cubicle – 1 (HB 1) k) Auxiliary circuit cubicle – 2 (HB 2) l) Auxiliary circuit cubicle – 1 (SB 1) m) Auxiliary circuit cubicle – 2 (SB 2) n) Filter cubicle o) Converter unit p) Front of pneumatic panel q) Back face of pneumatic panel r) Outside control s) Lighting and outside connection	

Module No.	***Brief Description***	***Duration***

STC-TRS-3 ϕ - 3		**6 Days**
1.	***Driving/braking*** a) Activating driver's cab b) Raising pantograph c) Closing VCB d) Switching on CP e) Operating Mode "AUTO" f) Operating Mode "MAN" g) Driving h) Braking i) Shutting down j) Active functions with deactivated drivers cab	
2.	***Charging the drivers cab*** a) Single unit running b) Multiple unit running	
3.	***Automatic vigilance*** a) Vigilance Mode b) Trigging Alarm c) Dead Man Mode d) Fire Alarm	
4.	***Speed recorder and indicator (Memotel)***	
5.	***Constant speed control (CSC)***	
6.	***Neutral section***	
7.	***Multiple operation***	
8.	***Trailing mode***	
9.	***Banking mode***	
10.	***Towing mode***	
11.	***Failure more operation***	
12.	***Information display screen***	

Module No.	***Brief Description***	***Duration***

STC-TRS-3 ϕ - 4		**6 Days**
	Faults a) Full message priorities b) Isolating of subsystems c) Fault isolation messages d) Restrictions due to isolating of various sub systems e) Status display of sub system f) Key to codes g) Browse h) Train configuration i) Energy consumption j) List of fault massages *k)* Abbreviations	
	2. Miscellaneous items **Loco Testing** a) Testing of various Electrical equipment of Locomotive. b) Testing of Pneumatic circuit of Locomotive. c) LT testing. d) HT testing. i. Various precautions such as – ii. Pre monsoon precaution iii. Pre summer precaution iv. Pre winter precaution etc.	

	5. GENERAL AND SUBSIDIARY RULES, SAFETY, FIRST AID, FIRE FIGHTING & DISASTER MANAGEMENT **(*Common to all streams of Electrical Engineering*)**	
Duration	**04Weeks**	
Place	**Nominated ZRTI/ ETC**	
Module No.	***Brief Description***	***Duration***
GEN-01	**General and Subsidiary Rules**	12 Days
	The course content for General and Subsidiary Rules training for electrical supervisors would be developed by respective ZRTIs. This course shall be conducted before sending trainee JE/SSE for attachment/on the job experience.	
	(Ref: RBE No.11/2009, letter No. E(MPP)/2009/3/16, New Delhi, dated 15 -01-2010)	
GEN-02	**Safety & Electrical accidents**	3 Days
e)	General safety rules, Importance of safety belts, helmets, ladders.	
f)	Preventive measures to avoid electrical accidents	
g)	Measures to be taken in case of electrical accident.	
h)	Case studies and discussion	
GEN-03	**Safety in electrified sections**	3 Days
f)	Induction effect on the nearby LT lines and yard lighting mains.	
g)	Safety precautions to be taken for PF shelters, fencing, FOBs, while working of cranes in the vicinity of OHE. etc.	
h)	Operation and Importance of locking of isolating switches of OHE	
i)	Importance of permit to work, earthing & bonding, temporary jumpering of rails in case of rail fracture.	
j)	Case studies and discussion	
GEN 04	**First Aid and Fire Fighting**	**3 Days**
e)	Types of Fire extinguishers, their application, methods of fire fighting.	
f)	Electrical shock treatment measures.	
g)	First aid for injury, burns	
h)	Audio/ Visual/ live demonstration of fire fighting and first aid.	
GEN 05	**Disaster Management**	**3 Days**
	Introduction to Disaster management.	
	Organizational infrastructure to effectively combat disaster (medical accessories, relief train, essential materials).	
	Break down management, preventive steps.	
	Analysis of breakdowns, case studies and discussion	
PHASE II	**TOTAL DURATION**	**08 WEEKS**

	6. COMPUTER TRAINING **(***Common to all streams of Electrical Engineering***)**	
Duration	**02 Weeks**	
Place	**Any Computer institute/ outsourced agency or Nominated ETC.**	
Module No.	***Brief Description***	***Duration***
CT 01	**Computer training**	02 Weeks
03	Theory and practical to gain proficiency in MS Office – Word, excel and power point, e-mail and web browsing.	

	7. FAMILIARIZATION WITH OTHER DEPARTMENTS (C&W, P-WAY & S&T) **(***Common to all streams of Electrical Engineering***)**	
Duration	**02 Weeks**	
Place	**Nearby concerned units of division** ***To make familiar with the working of other departments.***	
Module No.	***Brief Description***	***Duration***
OD 01	**Attachment to following shall be made for making familiarization with other Departments to understand their working and joint official procedure.**	02 Weeks
a)	Working of control office/ TPC/ TLC.	Control office
b)	P-Way maintenance/ assets	P.Way Depot/ site
c)	Sick lines, C&W depot/ activities	Sick lines, C&W Depots
d)	Signalling/ RRI working	Signalling/RRI Depot

	08. ATTACHMENT ON THE JOB EXPERIENCE	
Duration		**14 Weeks**
Place	**Allocated field unit where the trainee JE/SSE finally to be posted.**	
Module No.	***Brief Description***	***Duration***
Job Experience	**a.** Final phase of training shall comprise of on the job attachment wherein after completion of institutional and field training, the trainee JE/ SSEs shall be posted in the field units allocated to them by the concerned Railways. **b.** During this period, the trainees would perform like a JE/SSE working on an active assignment but would not be given independent charge. **c.** During this period, the trainees shall go through different technician training modules to understand the basic maintenance techniques. **d.** The programme for this attachment/on the job experience would be framed by the Officer in charge of the Division/extra Divisional Field Units where these JE/ SSEs are to be finally posted. **e.** During this period training in Electric Loco Work Shop, ELS, Trip Shed, (1 week at each place) **f.** During this training trainee shall select a current problem, study and prepare a project report containing details and probable causes and solutions. This should be shown during presentation before final exam**. (item no. 10 given below)**	**14 Weeks**

	09. MISCELLANEOUS TRAINING	
Duration	**03 Weeks**	
Place	**As per requirement in Division**	
Module No.	***Brief Description***	***Duration***
MT	Case studies of identified problems, promoting innovative ideas of trainees shall be explored during this period.	**03 weeks**
	Any training which is left over or required for the job of JE/SSE may be framed by officer in charge of divisional/ extra divisional field units.	
	For example If a JE or SSE is to work in Electric Loco Shed, he should visit major POH/ Repair Work Shops of division to observe different working techniques used, he should also visit for Loco foot plating while loco trail.	

	10. PRESENTATION OF PROJECT WORK	
Duration	**01 Week**	
Place	**Divisional / extra divisional field units**	
Module No.	***Brief Description***	***Duration***
PW	During attachment **on the job experience training (duration 14 weeks)**, trainee shall select a current problem, study and prepare a project report containing details and probable causes and solutions. This report shall be presented during session including all trainees so as to develop the communication and presentation skills.	**03 weeks**

	11. YOGA & MEDITATION	
Module No.	***Brief Description***	***Duration***
YM	Mandatory **"Yoga training"** as per Railway Board's circular no. **RBE No. 64/2015** circulated vide Railway Board's letter no. E (MPP)2015/3/10 New Delhi dated 15.06.2015, shall be provided to all trainees. The copy of referred letter is enclosed as Annexure-I.	**During phase I & Phase II**
Place	IRIEEN	

	12. POSTING EXAMINATION	
Duration	**01 Week**	
Place	**Concerned Division where he/she will be posted.**	

Total Duration = 52 week

2.Training Module For GS Stream (Power & TLAC)

Details and Sequence of Training Programme

Sr.No.	*Description*	*Duration in Weeks*	*Training Place*
1.	Joining formalities	**01**	Division/ Joining unit
2.	Phase I - Foundation Course (Common to All Streams)	**13**	IRIEEN/ Nominated ETC
3.	Field training	**03**	IRIEEN/ Nominated ETC
			Various field units like major Yards having different types of OHE/ OHE depots / Power supply installations / TPC / PSUs (BEML, BHEL, Larsen & Tubro, Alind, etc.)
4.	Phase-II Specialized Training Course in Traction Distribution	**08**	IRIEEN/ Nominated ETC
5.	General & Subsidiaries rules, Safety, First aid, Fire fighting & disaster management	**04**	Nominated ZRTI/ ETC
6.	Computer training	**02**	Nominated ETC/ outsourced Agency
7.	Familiarization with other departments (C & W, P-Way, S&T)	**02**	Nearby concerned units of division
8.	Attachment on the job experience	**14**	Field units where these JE/SSEs are finally to be posted
9.	Miscellaneous training	**03**	As per requirement by concerned division
10.	Presentation of project work	**01**	Divisional/ extra divisional field unit
11.	Yoga & Meditation	**--**	As per Railway Board Letter RBE 64/2015
12.	Posting examination	**01**	Divisional/ extra divisional field unit
	Total duration	**52**	

Initial Training Course for JE/SSE (Common to All Streams)

Discipline – GS & TL/AC
DURATION – 52 WEEKS

		Duration
	1. JOINING FORMALITIES	**1 Week**
Place	**Division / Joining unit**	
	2. PHASE I	
	FOUNDATION COURSE (FC) (***Common to all streams of Electrical Engineering***)	
Duration		**13 Weeks**
Place	**IRIEEN / Nominated Electrical Training Centre**	
Module No.	***Brief Description***	***Duration***
FC 01	**Introduction to working of Railway organization and electrical department set up, functions of various streams**	**4 Days**
	Registration formalities	
f)	General introduction to Indian Railways – Brief History, salient features.	
g)	Organizational structure - Railway administration/ Railway Board setup, Zonal setup, Divisional setup .	
h)	Introduction to Electrical Department- organizational structure, functions, role of electrical department in railway working etc.	
i)	Various units of railways, major workshops, production units, RDSO etc.	
j)	Duties of JE/ SSEs.	
FC 02	**Instrumentation**	**8 Days**
a)	Basic concepts of Condition Monitoring of electrical equipment,	
b)	Condition monitoring techniques	
	• DC tests - Insulation Resistance, Polarization Index etc.	
	• AC tests - Capacitance measurement, tan delta, Partial discharge, surge comparison test etc.	
c)	Condition monitoring of transformers - Theory and practice of Dissolved Gas Analysis (DGA), BDV etc.	
d)	Introduction of power cables	
e)	Non destructive testing techniques in various functions of electrical department like visual testing, Dye penetrate testing, Magnetic Particle testing, eddy current testing and ultrasonic testing	

Module No.	*Brief Description*	*Duration*
C 03	**Basic Electrical & Electronics**	**6 Days**
e)	Various terms, units, theory of passive components – L,C,R, basic principles of electricity and Electromagnetic induction and various laws i.e. Ohm's law, Kirchoff's law, etc	
f)	Classification of electronic components, Active Components – semiconductor physics, construction and operating principle,	
g)	Brief on Power Diodes, Zener Diodes, LEDs, BJTs, UJT, MOSFET, SCR, GTO and IGBT etc.	
h)	**Practical work on** – oscilloscopes, testing of passive electronic components, Testing of active components	
FC 04	**Power Electronics**	**08 Days**
k)	Control of 3 phase drives— Variable Voltage Variable	
l)	Frequency (VVVF) drives,	
m)	Overview of power electronics in 3 phase locomotives,	
n)	Static Inverter (SI Unit) and	
o)	AC Coach Inverter Unit.	
FC 05	**Welding Technology**	**02 Days**
i)	Basics of welding, , various types of welding techniques, gas and arc welding, gas cutting etc. and application of welding.	
j)	Safety during welding and gas cutting.	
k)	Checking of weld joints and defect prevention	
l)	Classification, properties and selection of electrodes.	
FC 06	**Engineering Materials and Metallurgy**	**04 Days**
o)	Ferrous and non ferrous metals used in Railways,	
p)	Brief on Heat treatment processes, Induction heating,	
q)	Brief on metal wear and lubrication,	
r)	Plain and roller bearings — theory, application, selection, maintenance and precautions,	
s)	Lubricants specifications, properties and selection,	
t)	Rubber components specifications and storage,	
u)	Electrolytic copper	

Module No.	*Brief Description*	*Duration*
FC 07	**Managerial Skills**	**05 Days**
w)	Aspects of leadership, leadership theory and evolution,	
x)	Leadership v/s management,	
y)	Role of supervisors in providing effective leadership.	
z)	Improving Communication, written and verbal, explain the purpose of communication, communication process, barriers to effective communication, ways to improve communication skills – writing, reading, speaking and listening.	
aa)	Basic in change management/ behaviour management.	
bb)	Team work, Importance of team work in organisations particularly in Railways, how to become a better team player.	
cc)	Time management, stress management, interactive exercises in team work, games and activities.	
dd)	Customer Satisfaction. Thinking from customer point of view – what are their needs/expectations and how can we best serve our customers.	
ee)	Positive Attitude	
ff)	Values in Administration	
gg)	Soft skill & Ethics	
FC 08	**Material Management (Stores, Store procurement, records, inventory management)**	**06 Days**
q)	Introduction to material management.	
r)	Organization structure of material management organisation of Indian Railways,	
s)	Functions of material management — Planning and inventory management (Stock items, PL no. & non stock items), purchase, Receipt and Inspection	
t)	Stocking and preservation, Periodic checking of stores, stock verification etc.	
u)	Distribution	
v)	Scrap disposal	
w)	DOs and Don'ts	
x)	**E- T**endering, **GEM** procurement & **GST** as in force in Rlys	

Module No.	*Brief Description*	*Duration*
FC 09	**Establishment & Industrial Management (DAR, Leave and pass rules)**	**6 Days**
s)	Rules relating to leave, passes, travel on duty	
t)	Railway accommodation and Staff Welfare.	
u)	Industrial relations and role of trade unions.	
v)	Discipline and Appeal Rules,	
w)	Conduct Rules.	
x)	Basics of RTI and Disabilities Acts and our obligations and responsibilities.	
y)	Labour Laws and hours of employment rules (HOER)	
z)	Rajbhasha	
aa)	**Establishment powers of JE & SSE in open line.**	
FC 10	**Contract Management & Financial management**	**6 Days**
	Contract Management	
q)	Tenders & Contracts	
r)	Vigilance	
	Financial Management	
s)	(Railway Accounting and Financing Procedures)	
t)	Primary units, various demands	
u)	Works programme, M&P and RS programme	
v)	Imprest management	
w)	Stages of budgeting (Revised and Budget Estimates, August Review, Final Modification)	
x)	**Role of JE & SSE in Tenders & Contracts.**	
FC 11	**Familiarisation with all streams of electrical Engineering in Railways**	**09 Days**
aa)	Familiarization with TRS, TRD, General Services (TL & AC and Power supply).	
bb)	Brief introduction of equipment and their functions of	
	xi. Electric loco conventional & three phase.	
	xii. EMU/MEMU conventional & three phase.	
	xiii. TrD – OHE/ PSI/ RC	
	xiv. General services power supply installations.	
	xv. Coaching train lighting & air conditioning.	
cc)	Periodicity of maintenance schedules of various assets:	
	xi. Electric loco conventional & three phase.	
	xii. EMU/MEMU conventional & three phase.	
	xiii. TrD – OHE/ PSI/ RC	
	xiv. General services power supply installations.	
	xv. Coaching train lighting & air conditioning.	
dd)	Electrical inspector general (EIG) related activities.	
ee)	Overview of Codes, manuals and other publications of electrical department issued by Railway board, RDSO etc.- These topics are to be covered in library by studying available hard/soft copies.	
ff)	Energy Conservation - Solar energy, wind energy etc.	
gg)	Visits to various nearby installations of TRD, TL/AC, Loco,	
hh)	EMU and general power supply installations.	

Module No.	*Brief Description*	*Duration*
FC 12	**IE Rules and Energy Conservation**	**04 Days**
ii)	Brief on I.E. Rules, Energy Conservation Act, BEE	
jj)	Codes, ECBC Code, Information on star rated products,	
kk)	Brief on clean development mechanism and carbon credits	
ll)	Solar lights, design, installation and maintenance	
mm)	Energy efficiency measures in Electrical assets	
Module No.	***Brief Description*** ***To make familiar with the working of other departments.***	***Duration/ Venue***
New OD	**Attachment to following shall be made for making familiarization with Other Departments to understand their Working and joint official procedure. (Newly Added)**	06 Days
i)	Working of control office/ TPC/ TLC.	Control office
j)	P-Way maintenance/ assets	P.Way Depot/ site
k)	Sick lines, C&W depot/ activities	Sick lines, C&W Depots
l)	Signalling/ RRI working	Signalling/RRI Depot
Module No.	***Brief Description***	***Duration***
PFGD	**Presentation feedback & group discussions**	**04 Days**
	Examination/ Viva voice	
	(*Topic for presentation will be assigned by CETI/ ETC in groups*)	
PHASE I	**TOTAL DURATION**	**13 WEEKS**

	3. FIELD TRAINING (***Trips will be conducted Stream wise by CETI/ ETCs under their control.***)	
Duration	**03 Weeks**	
Place	**Various field units like RCF/ICF/MCF/major workshops/ Major coaching depots / Power supply installations/ PSUs (BHEL/ BEML etc.), Construction sites of Railways.**	
Module No.	***Brief Description***	***Duration***
FT	Between the two phases of institutional training.	3 Weeks
➢	Trainee JE/ SSE should be sent for field training/ field visits, wherein they should be given exposure to practical work processes at various field units.	
➢	The field unit may be RCF/ICF/MCF/major workshops/ Major coaching depots / Power supply installations/ PSUs (BHEL/ BEML etc.)/ Construction sites of railways.	
➢	The object of this training is to familiarise the trainee with the actual assets & their equipment, their manufacturing/ assembling processes so that they can visualise the things during their specialised training.	

4.	**PHASE II**	
	Specialised Training Course in General Services (Power Supply, TL & AC Coaching)	
Duration	**08 Weeks**	
Place	**IRIEEN / Nominated Electrical Training Centre**	
Module No.	***Brief Description***	***Duration***
STC-GS-1	**Train Lighting**	**6 Days**
a)	Introduction to coaching stock & Train Lighting Systems, theory and practice SG/EOG/HOG schemes.	
b)	Self generating coach and equipment- Alternators, Rectifier /Regulator, Coach wiring, lighting and fans etc.	
c)	Batteries including VRLA,	
d)	V belts and pulleys	
e)	Maintenance schedules and activities of TL coaches.	**8 Days**
f)	LHB Non AC coaches, familiarization with major equipment and ratings,	
g)	Tools for coaching maintenance	
h)	Rake links , Coach Coding (Newly Added)	
i)	Relevant Manuals, RDSO, SMIs and Modification Sheets pertaining to TL coaches	
STC-GS-2	**Air Conditioning**	**12 Days**
a)	Fundamentals of Air Conditioning.	
b)	Basic theory and practice of air conditioning, Air conditioning systems on coaches,	
c)	LHB AC coaches, familiarization with major equipment and ratings,	
d)	Maintenance schedules and practices of LHB AC coaches,	
e)	Maintenance schedules and practices of LHB Non AC coaches,	
f)	Water raising system in coaches and mono block pump maintenance	
g)	Relevant Manuals, RDSO SMIs and Modification Sheets pertaining to AC coaches,	
h)	Power Car – Theory and practice of diesel engines, maintenance schedules, spare parts.	
i)	Pantry car & its equipment.	
STC-GS-3	**Operation and trouble shooting in TL & AC Coaches**	**6 Days**
a)	Operating Instructions for SG TL & AC coaches	
b)	Trouble shooting in Self Generating coaches	
c)	Trouble shooting LHB AC coaches	
d)	Fire causes and preventive measures in Railway coaches	
e)	Field trip to nearby coaching depot for understanding of LHB and conventional coaches	
STC-GS-4	**LHB CIRCUIT DIAGRAM**	**3 Days**
a)	Detailed Study of LHB AC Coach circuit Diagram	
b)	Detailed Study of LHB Power Car circuit Diagram	
c)	Detailed Study of LHB Pantry Car circuit Diagram	

PART – II : Power Supply (Electrical General Maintenance)

Module No.	*Brief Description*	*Duration*
STC-GS- 5	**Power supply installations**	**6 Days**
f)	Theory and practice of earthing, maintenance free earthing	
g)	Substation, equipment and maintenance, transformer,	
h)	switchgear, protection systems,	
i)	Power distribution systems,	
	Introduction to power cables	
d)	Condition monitoring of transformer, transformer oil, DGA, cables	
STC-GS-6	**Pumping Installations, UPS, and illumination**	**6 Days**
	Water supply pumping installations, types of pumps their specifications and selection for various applications,	
	Energy conservation measures in water pumping installations and maintenance of pumps.	
	Application of UPS/ inverters and its upkeep, maintenance	
	Illumination engineering, terminology, energy efficienct lamps,	
STC-GS- 7	**DG Sets and others**	**6 Days**
a)	Diesel Generators sets used in GS installations and maintenance	
b)	Lead acid batteries.	
c)	Safety at workplace, substation.	
d)	Relevant codes, RDSO SMIs and Modification pertaining to power supply and energy efficiency	
e)	Field trip to nearby power supply installations/ manufacturer for practical understanding	
Module No.	*Brief Description*	*Duration*
PFGD	**Presentation feedback & group discussions Examination/ Viva voice**	3 days
	(*Topic for presentation will be assigned by CETI/ ETC in groups*)	
PHASE II	**TOTAL DURATION**	**08 WEEKS**

	5. GENERAL AND SUBSIDIARY RULES, SAFETY, FIRST AID, FIRE FIGHTING & DISASTER MANAGEMENT **(*Common to all streams of Electrical Engineering*)**	
Duration	**04Weeks**	
Place	**Nominated ZRTI/ ETC**	
Module No.	***Brief Description***	***Duration***
GEN-01	**General and Subsidiary Rules**	12 Days
	The course content for General and Subsidiary Rules training for electrical supervisors would be developed by respective ZRTIs. This course shall be conducted before sending trainee JE/SSE for attachment/on the job experience.	
	(Ref: RBE No.11/2009, letter No. E(MPP)/2009/3/16, New Delhi, dated 15 -01-2010)	
GEN-02	**Safety & Electrical accidents**	3 Days
i)	General safety rules, Importance of safety belts, helmets, ladders.	
j)	Preventive measures to avoid electrical accidents	
k)	Measures to be taken in case of electrical accident.	
l)	Case studies and discussion	
GEN-03	**Safety in electrified sections**	3 Days
k)	Induction effect on the nearby LT lines and yard lighting mains.	
l)	Safety precautions to be taken for PF shelters, fencing, FOBs, while working of cranes in the vicinity of OHE. etc.	
m)	Operation and Importance of locking of isolating switches of OHE	
n)	Importance of permit to work, earthing & bonding, temporary jumpering of rails in case of rail fracture.	
o)	Case studies and discussion	
GEN 04	**First Aid and Fire Fighting**	**3 Days**
i)	Types of Fire extinguishers, their application, methods of fire fighting.	
j)	Electrical shock treatment measures.	
k)	First aid for injury, burns	
l)	Audio/ Visual/ live demonstration of fire fighting and first aid.	
GEN 05	**Disaster Management**	**3 Days**
	Introduction to Disaster management.	
	Organizational infrastructure to effectively combat disaster (medical accessories, relief train, essential materials).	
	Break down management, preventive steps.	
	Analysis of breakdowns, case studies and discussion	

	6. COMPUTER TRAINING (*Common to all streams of Electrical Engineering*)	
Duration	**02 Weeks**	
Place	**Any Computer institute/ outsourced agency or Nominated ETC.**	
Module No.	***Brief Description***	***Duration***
CT 01	**Computer training**	02 Weeks
04	Theory and practical to gain proficiency in MS Office – Word, excel and power point, e-mail and web browsing.	

	7. FAMILIARIZATION WITH OTHER DEPARTMENTS (C&W, P-WAY & S&T) (*Common to all streams of Electrical Engineering*)	
Duration	**02 Weeks**	
Place	**Nearby concerned units of division** ***To make familiar with the working of other departments.***	
Module No.	***Brief Description***	***Duration***
OD 01	**Attachment to following shall be made for making familiarization with other Departments to understand their working and joint official procedure.**	02 Weeks
m)	Working of control office/ TPC/ TLC.	Control office
n)	P-Way maintenance/ assets	P.Way Depot/ site
o)	Sick lines, C&W depot/ activities	Sick lines, C&W Depots
p)	Signalling/ RRI working	Signalling/RRI Depot

	08. MISCELLANEOUS TRAINING	
Duration	**03 Weeks**	
Venue	**As per requirement**	
Module No.	***Brief Description***	***Duration***
MT	Case studies of identified problems, promoting innovative ideas of trainees shall be explored during this period.	**03 Weeks**
	Any training which is left over or required for the job of JE/SSE may be framed by officer in charge of divisional/ extra divisional field units.	
	For Example No. 1 If a JE or SSE is to work in high voltage power supply installations, the training for maintenance high voltage equipment and transformers may be planned at Central Power Research Institutes etc.	
	For Example No. 2 If a JE or SSE is to work in Design section of manufacturing unit like RCF/ ICF, training for Design related software may be provided from any Govt. or private agency.	

	9. PRESENTATION OF PROJECT WORK	
Duration	**01 Weeks**	
Venue	**Divisional / extra divisional field units**	
Module No.	***Brief Description***	***Duration***
PW	During attachment **on the job experience training (duration 14 weeks)**, trainee shall select a current problem, study and prepare a project report containing details and probable causes and solutions.	**01 Week**
	This report shall be presented during session including all trainees so as to develop the communication and presentation skills.	
	10. YOGA & MEDITATION	
Module No.	***Brief Description***	***Duration***
YM	Mandatory **"Yoga training"** as per Railway Board's circular no. **RBE No. 64/2015** circulated vide Railway Board's letter no. E (MPP)2015/3/10 New Delhi dated 15.06.2015, shall be provided to all trainees. The copy of referred letter is enclosed as Annexure-I.	**During Phase-I & Phase-II**
Place	IRIEEN	
	11. POSTING EXAMINATION	
Duration	**01 Week**	
Venue	**Concerned Division where he/she will be posted.**	

Total Duration = 52 Weeks

Note: Above Training module is applicable to JE & SSE appointed in Drawing Cadre also.

4. PROMOTEE JEs'

Revised Training Programme for Promotee JEs' of Electrical Department.
Place: Respective Division/BTC /Zonal ETC.

Session-I (Theory)			
S. No.	**Training Module**	**No. of Days**	**Duration**
1.	Basic Orientation	1	
2.	Accident and Disaster Management	2	
3.	I E Rules, Permit to Work, Energy Conservation Act	2	
4.	Managerial Skills	2	
5.	Technical English	2	
6.	Computer Awareness	2	
7.	Establishment	2	
8.	Material Management and Inspection	3	
9.	Contract Management	2	
10.	Instrumentation	2	
11.	Basics of Power Electronics	1	
12.	Manufacturing Technology, Engineering Material and Metallurgy	2	
13.	Renewable Energy Sources	1	
Sub Total (Theory General)		**24**	**4 Weeks**
14.	Specialized Streams (Theory)		
a.	Coaching and General Services	9	
b.	Traction Distribution	6	
c.	Traction Rolling Stock and EMU	9	
Sub Total(Theory Specialized Courses)		**24**	**4 Weeks Respective Fields Only.**
Session-II (Practical Training)			
15.	Training at TPC and OHE Depot	6	
16.	Training at CLW and LOCO POH Shop	6	
17.	Training at PU and POH Shop (Coach)	6	
18.	On Job Training Stream Wise	6	
Sub Total(Practical Training)		**24**	**4 Weeks Respective Fields Only.**
Session-III (Refreshing/Exam/Viva etc.)			
19.	Final Exam/Viva Voce etc.	6	**1 Week**
Grand Total		**78**	**13 Week**

5. REFRESHER COURSE FOR

JE / SSE & DRG. CADRE

After every 3 years for TRD/TRS/GS/TLAC,
&
After every 5 years for Drawing cadre

Department: Electrical

Activity Centre: TRD

Trade: Supervisors (TRD)

(Periodicity once in 3 years)

Stage:- Refresher Course For Supervisors(TRD) / PSI /RC (Combined)

Module No.	Module Description	Days
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management GEM , E –Tendering	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec 2.4	Codes/ Manuals /SMIs/MIs, pertaining to TRD	
Elec TRD 2.1	Maintenance Schedules OHE, Switching Stations, Traction sub-stations, Powerline crossings, SCADA Thermo-vision Camera	
Elec TRD 2.2	Inspection schedules of Officers/ Supervisors , check lists of TRD assets OLIVER - G	
Elec TRD 2.4	Failure investigation/case studies on panto entanglement, OHE, mast hitting, sub station and SCADA failures	
Genl 2.5	Disaster management	
	Test/Feedback	
	Total	**2 Weeks**

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Department: Electrical

Activity Centre: Electrical (G)

Trade: Supervisors (Electrical)

(Periodicity once in 3 years)

Stage:- Refresher Course for Supervisors(electrical)

Module No.	Module Description	Days
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules) soft skill & ethics	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec 2.4	Codes/ Manuals /SMIs/Mis, pertaining to General services	
Elec 1.6	Maintenance Schedule and overhauling of energy meter, transformer, switchgears, protection devices, AC motors, alternators, DG sets and pumps ESCALATORS, UPS, LIFTS	
Elec 2.5	Inspection schedules of Officers/Supervisors , check lists of general services fire prevention measures	
Elec 1.15	Failure investigation/case studies on general services and plant maintenance energy conservation measures	
Genl 2.5	Disaster management	
	Test/Feedback	
	Total	**2 Weeks**

Department: Electrical

Activity Centre: Electrical (G)

Trade: Supervisors (TL/AC)

(Periodicity once in 3 years)

Stage:- Refresher Course for Supervisors(TL/AC)

Module No.	Module Description	Days
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules) soft skill & Ethics	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec - 2.4	Codes/ Manuals /SMIs/Mis, pertaining to General services	
Elec -1.12	Maintenance Schedule and overhauling of alternators, regulators, invertors, battery, belts, protection devices, AC plants, airconditioned coaches, roof mounted AC package unit LHB COACHES	
Elec -2.5	Inspection schedules of Officers/ Supervisors , check lists of TL/AC LHB Coach & fire prevention measures	
Elec -1.19	Failure investigation/case studies on TL/AC	
Genl 2.5	Disaster management	
	Test/Feedback	
	Total	**2 Weeks**

Special emphasis may be given on new generation coaches introduced by railway time to time.

Department: Electrical
Activity Centre: Electrical Loco Shed
Trade: Supervisors (loco)

(Periodicity once in 3 years)

Stage:- Refresher Course For Supervisors(loco)

Module No.	Module Description	Days
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management **GEM, E - Tendering(Newly added)**	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec 2.4	Codes/ Manuals /SMIs/MIs, pertaining to loco	
Elec-Loco-2.1	Maintenance Schedules and ovehauling Of Electric loco and equipment viz. TFP, RSI, SL, TM, RS, DJ, contactors, relays, lights, arno, auxiliary Machines Conventional & 3 phase loco in detail **(Newly added)**	
Elec-loco-2.4	Inspection schedules of Officers/ Supervisors , check lists of electric locomotives	
Elec-loco-2.6	Failure investigation/case studies on electric locomotives	
Genl-2.5	Disaster management	
	Test/Feedback	
	Total	**2 Weeks**

01 Week for technical 01 week for non-technical.

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Department: Electrical

Activity Centre: EMU

Trade: Supervisors (EMU)

(Periodicity once in 3 years)

Stage:- Refresher Course for Supervisors(EMU)

Module No.	Module Description	Days
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec 2.4	Codes/ Manuals /SMIs/Mis, pertaining to EMU	
Elec-EMU-2.2 Elec-EMU-2.3 Elec-EMU-2.4	Maintenance Schedules and ovehauling Of EMU equipment viz. TFP, TM, DJ, contactors, relays, lights, arno, auxiliary machines, bogies, suspension, brake rigging, wheels, gears, couplers, compressor, exhauster, valves, panto	
Elec-EMU-2.5	Inspection schedules of Officers/ Supervisors , check lists of EMU	
Elec-EMU-2.7	Failure investigation/case studies on EMU	
Genl 2.5	Disaster management	
	Test/Feedback	
	Total	**2 Weeks**

Three phase / Conventional as per availability in the particular shed in all above modules.

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Revised Training Module for Gr. C & D Electrical Staff (other than JE/SSE)

INDEX

TRAINING COURSES INDEX OF ELECTRICAL DEPARTMENT

Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Course No.	**Description**	**Duration** (In Week)
Elect 01	Initial Course for Group 'D' all trades	02
Elect 02	Disaster Management	01
	ELECTRICAL TRD DEPARTMENT	
Elect 03	Promotional Course from Unskilled to Skilled Artisans (Technician OHE)	03
Elect 04	Promotional Course from Unskilled to Skilled Artisans (Technician PSI & RC)	03
Elect 05	Initial Course for Apprentice Technician OHE PSI & RC (ITI)	26 -
Elect 06	Initial Course for Apprentice Technician OHE PSI & RC (NON-ITI)	78
Elect 07	Refresher Course for Technician OHE (Once in 5 years)	02
Elect 08	Refresher Course for Technician PSI & RC (Once in 5 years)	02
Elect 09	Promotional course from Technician to Supervisors(TRD)	03
Elect 10	Refresher Course Tower Wagon Operation & Maintenance	01
	ELECTRICAL (G) DEPARTMENT	-
Elect 11	Promotional Course from Unskilled to Skilled Artisans & Technician Plant (Technician Electrical)	03
Elect 12	Promotional Course from Unskilled to Skilled Artisans (Technician TL/AC)	03
Elect 13	Initial Course for Apprentice Technician (Elect) & Plant (ITI)	26
Elect 14	Initial Course for Apprentice Technician (Elect) & Plant (NON-ITI)	**78**
Elect 15	Initial Course for Apprentice Technician TL/AC (ITI)	-
Elect 16	Initial Course for Apprentice Technician TL/AC (NON- ITI)	78
Elect 17	Refresher Course for Technician (Elect) & Technician Plant (Once in 5 Years)	02

Course No.	Description	Duration
Elect 18	Refresher Course for Technician TL/AC (Once in 5 years)	02
Elect 19	Promotional course from Technician to Supervisors(Elect)	**03**
Elect 20	Promotional course from Technician to Supervisors(TL/AC)	**03**
	ELECTRICAL LOCO DEPARTMENT	
Elect 21	Promotional Course from Unskilled to Skilled Artisans (Technician Elect Loco)	03
Elect 22	Initial Course for Apprentice Technician Elect Loco (ITI)	26
Elect 23	Initial Course for Apprentice Technician Elect Loco (NON-ITI)	**78**
Elect 24	Refresher Course for Technician Elect Loco(Once in 5 years)	02
Elect 25	Promotional course from Technician to Supervisors(Elect Loco)	**03**
	ELECTRICAL EMU DEPARTMENT	
Elect 26	Promotional Course from Unskilled to Skilled Artisans (Technician EMU)	03
Elect 27	Initial Course for Apprentice Technician EMU/MEMU (ITI)	26
Elect 28	Initial Course for Apprentice Technician EMU/MEMU (NON-ITI)	**78**
Elect 29	Refresher Course for Technician EMU(Once in 5 years)	02
Elect 30	Promotional course from Technician to Supervisors(EMU)	**03**

(Elect 01)

DEPARTMENT: Electrical
Activity Centre: ALL
Trade: Group 'D' All

Stage: - Training Module for initial Course for Group 'D' all trades

Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
EL01.	Foundation	
EL02.	Measuring/ Portable Tools	
EL03.	Basic information on handling/Storing of Material	
EL04	Personal Safety, electrical accidents, fire fighting	
EL05.	First aid	
EL06	Material handling & Operation of equipments	
EL07.	Clearance and upkeep of Working environment	
	Test/Feedback	
	Total	**2 Weeks**

(Elect 02)

DEPARTMENT: Electrical
Activity Centre: ALL
Trade: Gr. C & D ALL

Stage: - Disaster Management **(Periodicity once in 5 years)**

Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
El-04	Personal Safety, Electrical Accidents, Fire Fighting,	
El-05	First Aid	
Gen- 2.5	Concept of Disaster Management, Infrastructural Requirements, efficient management, coordination	
	Case studies	
	Test/Feedback	
	Total	01 Week

(Elect 03)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Technician OHE

Stage:- Promotional Course from Unskilled to Skilled Artisans (Technician OHE)

Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling & storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms Thermo Vision Camera	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-TRD-1.1	Names, sizes, location of major OHE equipments (cantilever, Masts, ATD , section insulator, Overlap, turn out, cross over, neutral section etc. **Current collection Test (Oliver – G)**	
ELEC-TRD-1.2	Maintenance schedules, critical points, settings and tolerance of major OHE equipments	
ELEC-TRD-1.3	Testing, erection and commissioning of major OHE equipments	
	Test/Feedback	
	Total	**03 Weeks**

(Elect 04)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Technician PSI & RC

Stage:-Promotional Course from Unskilled to Skilled Artisans (Technician PSI & RC)

Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling & storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams Thermo Vision Camera(Newly added)	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-TRD-1.4	Names, sizes, location of major PSI, sub station and remote control equipments (Power transformers, CB, BM,CT, BT,AT, PT, Relays, Batteries, SCADA, Bonding and earthing etc.	
ELEC-TRD-1.5	Maintenance schedules, critical points, settings and tolerance of major PSI, sub station and remote control equipments	
ELEC-TRD-1.6	Testing, erection and commissioning of major PSI, sub station and remote control equipments	
	Test/Feedback	
	Total	**03 Weeks**

(Elect 05)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Apprentice Technician OHE /PSI / RC

Stage:- Initial Training Course for Apprentice Technician OHE /PSI /RC
(ITI, Direct Recruit through RRB) (Common for ALL OHE,PSI & RC)
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Venue
	Foundation Course	**3 W**	**ETC**
ELEC-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC-TRD-1.1	Names, sizes, location of major OHE equipments (Cantilever, Masts, ATD, section insulator, Overlap, turn out, cross over, neutral section etc.)		
ELEC-TRD-1.2	Maintenance schedules, critical points, settings and tolerance of major OHE equipments **OLIVER - G**		
ELEC-TRD-1.3	Testing, erection and commissioning of major OHE Equipments **Thermo-vision Camera**		
	Training in other related stream	**2 W**	**Elec. Trg. Centre**
ELEC-TRD-1.4	Names, sizes, location of major PSI, substation and remote control equipments (Power transformers, CB, BM, CT, BT, AT, PT, Relays, Batteries, SCADA, Bonding and earthing etc.		
ELEC-TRD-1.5	Maintenance schedules, critical points, settings and tolerance of PSI, substation and remote control equipments		
ELEC-TRD-1.6	Testing, erection and commissioning of PSI, sub station		

	and remote control equipments		
	Practical training in OHE	**12 W**	**Depots/Sites**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination/Feedback	**1 W**	**Elec. Trg. Centre**
	Total	**(26 W)**	

(Elect 06)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Apprentice Technician OHE/ PSI / RC

Stage: - Initial Training Course for Apprentice Technician OHE/ PSI / RC (Non-ITI) (Common to ALL OHE, PSI & RC)

Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Venue
	Foundation Course	**3 W**	**ETC**
ELEC-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Theory	**4 W**	**Elec. Trg. Centre**
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Practical	**4 W**	**Shops**
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC-TRD-1.1	Names, sizes, location of major OHE equipments (Cantilever, Masts, ATD, section insulator, Overlap, turn out, cross over, neutral section etc.)		
ELEC-TRD-1.2	Maintenance schedules, critical points, settings and tolerance of major OHE equipments OLIVER - G		
ELEC-TRD-1.3	Testing, erection and commissioning of major OHE Equipments **Thermo Vision camera**		
	Training in other related stream	**2 W**	**Elec. Trg. Centre**
ELEC-TRD-1.4	Names, sizes, location of major PSI, substation and remote control equipments (Power transformers, CB, BM, CT, BT, AT, PT, Relays, Batteries, SCADA, Bonding and		

	earthing etc.		
ELEC-TRD-1.5	Maintenance schedules, critical points, settings and tolerance of PSI, substation and remote control equipments		
ELEC-TRD-1.6	Testing, erection and commissioning of PSI, sub station and remote control equipments		
	Practical training in OHE	**56 W**	**Depots/Sites**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination/Feedback	**1 W**	**Elec. Trg. Centre**
	Total	**78 W**	

(Elect 07)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Technician (OHE)

(Periodicity once in 5 years)

Stage: - Refresher Course for Skilled Artisans (Technician OHE)
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling & storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-TRD-1.1	Names, sizes, location of major OHE equipments (Cantilever, Masts, ATD, section insulator, Overlap, tur n out, cross over, neutral section etc).	
ELEC-TRD-1.2	Maintenance schedules, critical points, settings and tolerance of major OHE equipments **Thermo Vision Camera**	
ELEC-TRD-1.3	Testing, erection and commissioning of major OHE Equipments **Current collection Test / OLIVER - G**	
ELEC-TRD-1.7	Codes/Manuals/SMIs /MIs on TRD	
ELEC-TRD-1.8	Case studies on failures on OHE	
	Test/Feedback	
	Total	**02 Weeks**

(Elect 08)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Technician PSI/RC

(Periodicity once in 5 years)

Stage: - Refresher Course for Artisans (Technician PSI/RC)
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling & storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical Terms **Thermo-vision Camera**	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-TRD-1.4	Names, sizes, location of major PSI, substation and remote control equipments (Power transformers, CB, BM, CT, BT, AT, PT, Relays, Batteries, SCADA, Bonding and earthing etc.	
ELEC-TRD-1.5	Maintenance schedules, critical points, settings and tolerance of major PSI, substation and remote control equipments	
ELEC-TRD-1.6	Testing, erection and commissioning of major PSI, sub station and remote control equipments	
ELEC-TRD1.7	Codes/Manuals/SMIs/MIS on TRD	
ELEC-TRD-1.9	Case studies on failures of PSI and remote control	
	Test/Feedback	
	Total	**2 Weeks**

(Elect 09)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Supervisors

Stage:- Promotional Course from Gr.I Artisans to Supervisors(TRD)
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Curtail to 03 Weeks & to be conducted by BTC

Module No.	Module Description	Duration
Elec- 01	Introduction to railway organization and electric department set up	
Elec- 2.1	General Electrical technology, measuring tools/equipments	
Elec-2.2	Safety Rules, precautions, earthling of equipment, accidents, fire fighting, First Aid	
Elec- 2.3	Material handling, jigs and fixtures, up keep of work environment	
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec -2.4	Codes/ Manuals /SMIs/MIs, pertaining to TRD	
Elec-TRD-2.1	Maintenance Schedules OHE, Switching Stations, Traction sub-stations, Powerline crossings, SCADA **Thermo-vision Camera & Current Collection Test / OLIVER –G**	
Elec-TRD-2.2	Inspection schedules of Officers/ Supervisors , check lists of TRD assets	
Elec-TRD-2.3	Testing/erection/ commissioning of various TRD equipment	
Elec-TRD-2.4	Failure investigation/case studies on panto entanglement, OHE, mast hitting, substation and SCADA failures	
Genl -2.5	Disaster management	
	Test/Feedback	
	Total	**3 Weeks**

(Elect 10)

DEPARTMENT: Electrical
Activity Centre: TRD
Trade: Tower Wagon

(Periodicity once in 3 years)

Stage:- Refresher Course Tower Wagon Operation And Maintenance
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration
Elec-TRD-1.10	Introduction to Tower Wagon and its types	
Elec-TRD-1.11	Location of Important parts and their functions, Prime Mover, Power Transmission. G&SR	
Elec-TRD-1.12	Maintenance schedules, critical points, settings and tolerances	
Elec-TRD-1.13	Testing, erection and commissioning. **By OEM**	
Elec-TRD-1.14	Trouble shooting **By OEM**	
	Test/Feedback	
	Total	1 Week

(Elect 11)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)
Trade: Technician (Electrical) & Plant

Stage:-Promotional Course from Unskilled to Skilled Artisans
(Technician Electrical)
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling & storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-1.5	Names, sizes, location of major power supply equipments (transformers, Relays, contactors, Batteries, Lift ,wiring, electric fittings, meters, switch board , yard lighting and Power line crossing, cranes) Motors, Starters, LED Lighting ,Energy Conservation , DG Set , Pumps	
ELEC-1.6	Maintenance schedules, critical points, settings and tolerance of major power supply equipments & **Earthing Maintenance**	
ELEC-1.7	Testing, erection and commissioning of major power supply equipments	
Genl-1.1	Basics of carpentry and mason trade	
	Test/Feedback	
	Total	**3 Weeks**

(Elect 12)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)
Trade: technician (TL/AC)

Stage: - Promotional Course from Unskilled to Skilled Artisans (Technician TL/AC)
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling & storage, proper up keep of work area. LHB Coach, Power Car, Pantry car circuit diagram	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC- 1.11	Names, sizes, location of generating equipments , belts, batteries, electrical fittings, AC plant, Air conditioning of coach, roof mounted, AC package unit	
ELEC-1.12	Maintenance schedules, critical points, settings and tolerance of TL/ AC equipments **Fire Prevention & Safety**(Newly added)	
ELEC - 1.13	Testing, erection and commissioning of TL /AC equipments	
	Test/Feedback	
	Total	**3 Weeks**

(Elect 13)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)
Trade: Apprentice Technician Elec.

Stage: - Initial Training Course for Apprentice Technician Elec (ITI, Direct Recruit through RRB)

Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**ETC**
ELEC-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC-1.5	Names, sizes, location of major Electrical equipments (Transformers, Relays, contactors, Batteries, Lift, wiring, electric fittings, meters, switch board, yard lighting and Power line crossing, **Escalators, lift, UPS, LED Lighting , DG Sets** (Newly added)		
ELEC-1.6	Maintenance schedules, critical points, settings and tolerance of major power supply equipments		
ELEC-1.7	Testing, erection and commissioning of major power supply equipments		
	Training in other related streams	**2 W**	**Elec. Trg. Centre**
Elec 1.8	Name, size, location of various plants **Escalators, lifts, UPS,** (pumps, DG sets)		
Elec 1.9	Maintenance schedules, critical points, settings and tolerance of major plants **Escalators, lifts, UPS**(pumps, DG sets)		
Elec. 1.10	Testing, erection and commissioning of plants (pumps, DG sets)		

	Practical training in Power supply	**12 W**	**Depots/Shops**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination	**1 W**	**Elec. Trg. Centre**
	Total	**(26 W)**	

(Elect 14)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)/ Plants
Trade: Apprentice Technician Electrical

Stage: - Initial Training Course for Apprentice Technician Electrical (Non-ITI)
Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**ETC**
ELEC-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop) - Theory	**4 W**	**Elec. Trg. Centre**
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop) - Practical	**4 W**	**Shops**
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC-1.5	Names, sizes, location of major Electrical equipments (Transformers, Relays, contactors, Batteries, Lift, wiring, electric fittings, meters, switch board, yard lighting and Power line crossing, Escalators, Lifts UPS ,LED lighting ,DG Sets, pumps) (Newly added)		
ELEC-1.6	Maintenance schedules, critical points, settings and tolerance of major power supply equipments		
ELEC-1.7	Testing, erection and commissioning of major power supply equipments		
	Training in other related streams	**2 W**	**Elec. Trg. Centre**
Elec 1.8	Name, size, location of various plants) **Escalators UPS** (pumps, DG sets)		

Elec 1.9	Maintenance schedules, critical points, settings and tolerance of major plants (pumps, DG sets) **Transformer**		
Elec. 1.10	Testing, erection and commissioning of plants (pumps, DG sets)		
	Practical training in Power supply	**56 W**	**Depots/Shops**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination	**1 W**	**Elec. Trg. Centre**
	Total	**78 W**	

(Elect 15)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)
Trade: Apprentice Technician TL/AC
Stage: - Initial Training Course for Apprentice Technician TL/AC (ITI, Direct Recruit through RRB)

Place: All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**ETC**
Elect-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area. Soft skill & Ethics		
ELEC-1.2	General Electrical techno logy, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC- 1.11	Names, sizes, location of TL/AC equipments viz. generating equipments , belts, batteries, electrical fittings, AC plant, Air conditioning of coach, roof mounted, AC package unit **LHB coach, Pantry car & Power car)**		
ELEC-1.12	Maintenance schedules, critical points, settings and tolerance of TL/AC equipments LHB coach, Pantry car & Power car) & fire prevention measures		
ELEC - 1.13	Testing, erection and commissioning of TL/AC equipments		
	Training in other related streams	**2 W**	**Elec. Trg. Centre**
Elec 1.8	Name, size, location of various plants (pumps, DG sets) **LHB coach, Pantry car & Power car**		
Elec 1.9	Maintenance schedules, critical points, settings and tolerance of major plants (pumps, DG sets) **LHB coach, Pantry car & Power car**		
Elec. 1.10	Testing, erection and commissioning of plants (pumps, DG sets) **LHB coach, Pantry car & Power car**		

	Practical training in TL/AC	**12 W**	**Depots/Shops**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination	**1 W**	**Elec. Trg. Centre**
	Total	**(26 W)**	

(Elect 16)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)
Trade: Apprentice Technician TL/AC
Stage:- Initial Training Course for Apprentice Technician TL/AC (Non- ITI)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**ETC**
ELEC-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area. **Soft skill & ethics**		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Theory	**4 W**	**ETC**
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Practical	**4 W**	**Shops**
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC- 1.11	Names, sizes, location of TL/AC equipments viz. generating equipments , belts, batteries, electrical fittings, AC plant, Air conditioning of coach, roof mounted, AC package unit **LHB coach, Pantry car & Power car) & Fire prevention measures.**		
ELEC-1.12	Maintenance schedules, critical points, settings and tolerance of TL/AC equipments		
ELEC - 1.13	Testing, erection and commissioning of TL/AC equipments		
	Training in other related streams	**2 W**	**ETC**
Elec 1.8	Name, size, location of various plants (pumps, DG sets)		
Elec 1.9	Maintenance schedules, critical points, settings and tolerance of major plants (pumps, DG sets) **LHB coach, Pantry car & Power car)**		
Elec. 1.10	Testing, erection and commissioning of plants (pumps, DG sets)		

	Practical training in TL/AC	**56 W**	**Depots/Shops**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination	**1 W**	**Elec. Trg. Centre**
	Total	**78 W**	

(Elect 17)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)
Trade: Technician Electrical

(Periodicity once in 5 years)

Stage:- Refresher Course for Skilled Artisans (Technician Electrical)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling & storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC- 1.5	Names, sizes, location of major Electrical power supply equipments (Transformers, Relays, contactors, Batteries, Lift, wiring, electric fittings, meters, switch board, yard lighting and Power line crossing) **Escalators, lifts, UPS, DG Sets. Pumps, starter, Fire prevention measures**	
ELEC-1.6	Maintenance schedules, critical points, settings and tolerance of major power supply equipments	
ELEC - 1.7	Testing, erection and commissioning of power supply equipments	
ELEC-1.14	Codes/ Manuals/SMIs/MIS on Power supply maintenance	
ELEC-1.15	Case studies on failures on Power maintenance	
	Test/Feedback	
	Total	**02 Weeks**

(Elect 18)

DEPARTMENT: Electrical
Activity Centre: Electrical(G)
Trade: Technician TL/AC

(Periodicity once in 5 years)

Stage:- Refresher Course for Skilled Artisans (Technician TL/AC)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling& storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC- 1.11	Names, sizes, location of generating equipments , belts, batteries, electrical fittings, AC plant, Air conditioning of coach, roof mounted, AC package unit **LHB coach features, and fire prevention measures.(Newly added)**	
ELEC-1.12	Maintenance schedules, critical points, settings and tolerance of TL/AC equipments	
ELEC - 1.13	Testing, erection and commissioning of TL/AC	
ELEC-1.18	Codes/ Manuals/SMIs/MIS on TL/AC maintenance	
ELEC-1.19	Case studies on failures on TL/AC	
	Test/Feedback	
	Total	**02 Weeks**

(Elect 19)

DEPARTMENT: Electrical
Activity Centre: Electrical (G)
Trade: Supervisors(Electrical)

Stage:- Promotional Course from Gr.I Artisans to Supervisors(Electrical)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration
Elec- 01	Introduction to railway organization and electric department set up	
Elec- 2.1	General Electrical technology, measuring tools/equipments	
Elec –2.2	Safety Rules, precautions, earthling of equipment, accidents, fire fighting, First Aid	
Elec- 2.3	Material handling, jigs and fixtures, up keep of work environment	
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec –2.4	Codes/ Manuals /SMIs/MIS, pertaining to General services	
Elec –1.6	Maintenance Schedule and overhauling of energy meter, transformer, switchgears, protection devices, AC motors, alternators,	
Elec –1.9	Maintenance Schedule and overhauling of DG sets and pumps	
Elec- 2.5	Inspection schedules of Officers/ Supervisors , check lists of general services	
Elec- 1.7	Testing/erection/ commissioning of various power supply equipment	
Elec- 1.10	Testing/erection/ commissioning of DG Sets and pumps	
Elec –1.15	Failure investigation/case studies on power supply	
Elec –1.17	Failure investigation/case studies on failure of plants (DG sets & pumps)	
Genl –2.5	Disaster management	
	Test/Feedback	
	Total	**03 Weeks**

(Elect 20)

DEPARTMENT: Electrical
Activity Centre: Electrical(G)
Trade: Supervisors(TL/AC)

Curtail to 03 Weeks & to be conducted by BTC

Stage:- Promotional Course from Gr.I Artisans to Supervisors(TL/AC)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration
Elec- 01	Introduction to railway organization and electric department set up	
Elec- 2.1	General Electrical technology, measuring tools/equipments	
Elec –2.2	Safety Rules, precautions, earthling of equipment, accidents, fire fighting, First Aid	
Elec- 2.3	Material handling, jigs and fixtures, up keep of work environment	
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec -2.4	Codes/ Manuals /SMIs/MIS pertaining to General services	
Elec–1.12	Maintenance Schedule and overhauling of alternators, regulators, invertors, battery, belts, protection devices, AC plants, air conditioned coaches, roof mounted AC package unit	
Elec –2.5	Inspection schedules of Officers/ Supervisors , check lists of General Services	
Elec -1.13	Testing/erection/ commissioning of various TL/AC equipment	
Elec -1.19	Failure investigation/case studies on TL/AC	
Genl -2.5	Disaster management	
	Test/Feedback	
	Total	**03 Weeks**

(Elect 21)

DEPARTMENT: Electrical
Activity Centre: Electrical Loco Shed
Trade: Technician Electric Loco

Stage:- Promotional Course from Unskilled to Skilled Artisans (Technician Electric Loco)

Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling& storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-Loco- 1.1	Over view of Power , auxiliary and control circuit	
ELEC-Loco- 1.2	Names, sizes, location of major Electric loco equipments (Power transformer, circuit breaker, Panto, Traction and auxiliary motors, Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pneumatic valves) **of Convectional Loco or Three Phase Loco (Types of loco available in particular shed**)	
ELEC-Loco- 1.3	Maintenance schedules, critical points, settings and tolerance of Electric loco equipments	
ELEC-Loco- 1.4	Testing, erection and commissioning of Electric loco equipments	
	Test/Feedback	
	Total	**3 Weeks**

(Elect 22)

DEPARTMENT: Electrical
Activity Centre: Electrical Loco Shed
Trade: Apprentice Technician Elect. Loco

Stage:- Initial Training Course for Apprentice Technician Elect. Loco (ITI, Direct Recruit through RRB)

Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**ETC**
ELEC-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC-Loco- 1.1	Over view of Power , auxiliary and control circuit		
ELEC-Loco- 1.2	Names, sizes, location of major Electric loco equipments **(of Convectional Loco or Three Phase Loco (Types of loco available in particular shed)** (Power transformers, circuit breaker, Panto, traction and auxiliary motors , Arno,Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pneumatic valves) traction convertor, dc links,aux converter,3 phase tech, etc)		
ELEC-Loco- 1.3	Maintenance schedules, critical points, settings and tolerance of major Electric loco equipments		
ELEC-Loco- 1.4	Testing, erection and commissioning of major Electric loco equipments		
	Training in other related stream	**2 W**	**Elec. Trg. Centre**
ELEC EMU-1.1	Rake formation, classification of coaches,		
ELECEMU- 1.2	Over view of Power , auxiliary and control circuit		

ELEC EMU-1.3	Names, sizes, location of major equipments of EMU/MEMU		
ELEC-EMU-1.4	Maintenance schedules, critical points, settings and tolerance of major EMU equipments		
ELEC-EMU-1.5	Testing, erection and commissioning of major EMU equipments		
	Practical training in Loco	**12 W**	**Sheds/Shops**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination	**1 W**	**Elec. Trg. Centre**
	Total	**26 W**	

(Elect 23)

DEPARTMENT: Electrical
Activity Centre: Electrical Loco Shed
Trade: Apprentice Technician Elect. Loco
Stage:- Initial Training Course for Apprentice Technician Elect. Loco (Non-ITI)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**Elec.Trg.Centre**
Elect-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Theory	**4 W**	**Elec.Trg.Centre**
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Practical	**4 W**	**Shops**
	Theoretical Training in the allotted streams	**4 W**	**Elec.Trg.Centre**
ELEC-Loco- 1.1	Over view of Power , auxiliary and control circuit		
ELEC-Loco- 1.2	Names, sizes, location of major Electric loco equipments) **of Convectional Loco or Three Phase Loco (Types of loco available in particular shed**) (Power transformers, circuit breaker, Panto, traction and auxiliary motors , Arno, Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pneumatic valves)		
ELEC-Loco- 1.3	Maintenance schedules, critical points, settings and tolerance of major Electric loco equipments		
ELEC-Loco- 1.4	Testing, erection and commissioning of major Electric loco equipments		
	Training in other related stream	**2 W**	**Elec.Trg.Centre**
ELEC- EMU-1.1	Rake formation, classification of coaches,		
ELEC-EMU- 1.2	Over view of Power , auxiliary and control circuit		

ELEC- EMU-1.3	Names, sizes, location of major equipments of EMU/MEMU		
ELEC-EMU- 1.4	Maintenance schedules, critical points, settings and tolerance of major EMU equipments		
ELEC-EMU- 1.5	Testing, erection and commissioning of major EMU equipments		
	Practical training in Loco	**56 W**	**Sheds/Shops**
	Technical tour	**2 W**	**Visit to Equip Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination	**1 W**	**Elec. Trg. centre**
	Total	**78 W**	

(Elect 24)

DEPARTMENT: Electrical
Activity Centre: Electrical Loco Shed
Trade: Technician Elect. Loco

(Periodicity once in 5 years)

Stage:- Refresher Course for Artisans (Technician Elect Loco)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling& storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-Loco-1.2	Names, sizes, location of major Electric loco equipments) **of Convectional Loco or Three Phase Loco (Types of loco available in particular shed) Newly Added** (Power transformers, circuit breaker, Pan to, Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pneumatic valves	
ELEC-Loco-1.3	Maintenance schedules, critical points, settings and tolerance of major Electric loco equipments	
ELEC-Loco-1.4	Testing, erection and commissioning of major Electric loco equipments	
ELEC-Loco-1.5	Codes/Manuals/SMIs/MIS on Elect Loco	
ELEC-Loco-1.6	Case studies on failures of Elect Loco	
	Test/Feedback	
	Total	**2 Weeks**

(Elect 25)

DEPARTMENT: Electrical
Activity Centre: Electrical Loco Shed
Trade: Supervisors(loco)

Stage:- Promotional Course from Gr.I Artisans to Supervisors(loco)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration
Elec-01	Introduction to railway organization and electric department set up	
Elec-2.1	General Electrical technology, measuring tools/equipments	
Elec-2.2	Safety Rules, precautions, earthling of equipment, accidents, fire fighting, First Aid	
Elec-2.3	Material handling, jigs and fixtures, up keep of work environment	
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec -2.4	Codes/ Manuals /SMIs/MIS, pertaining to loco	
Elec-Loco-2.1	Maintenance Schedules and ovehauling Of Electric loco equipment viz. TFP, RSI, SL, TM, RS, DJ, contactors, relays, lights, arno, auxiliary machines	
Elec-loco 2.2	Maintenance Schedule and overhauling of Mechanical equipment viz bogies, suspension, brake rigging, wheels, gears, couplers	
Elec-loco-2.3	Maintenance Schedule and overhauling of compressor, exhauster, valves, panto	
Elec-loco-2.4	Inspection schedules of Officers/ Supervisors , check lists of electric locomotives	
Elec-loco-2.5	Testing/erection/ commissioning of various loco equipment	
Elec-loco-2.6	Failure investigation/case studies on electric locomotives	
Genl-2.5	Disaster management	
	Test/Feedback	
	Total	**3 Weeks**

(Elect 26)

DEPARTMENT: Electrical
Activity Centre: EMU
Trade: Technician EMU

Stage:- Promotional Course from Unskilled to Skilled Artisans (Technician EMU)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling& storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC- EMU-1.1	Rake formation, classification of coaches,	
ELEC-EMU- 1.2	Over view of Power , auxiliary and control circuit	
ELEC- EMU-1.3	Names, sizes, location of major EMU equipments **Three phase or Conventional (Type available in Shed)** (Power transformers, circuit breaker, Panto, , Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pneumatic valves, traction and auxiliary motors)	
ELEC-EMU- 1.4	Maintenance schedules, critical points, settings and tolerance of major EMU equipments	
ELEC-EMU- 1.5	Testing, erection and commissioning of major EMU equipments	
	Test/Feedback	
	Total	**3 Weeks**

(Elect 27)

DEPARTMENT: Electrical
Activity Centre: EMU
Trade: Apprentice Technician EMU/MEMU

Stage:- Initial Training Course for Apprentice Technician EMU/MEMU (ITI, Direct Recruit through RRB)

Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**ETC**
ELEC-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC- EMU-1.1	Rake formation, classification of coaches,		
ELEC-EMU- 1.2	Over view of Power , auxiliary and control circuit		
ELEC-EMU- 1.3	Names, sizes, location of major EMU equipments Three phase or Conventional (Type available in Shed) (Power transformers, circuit breaker, Panto, traction and auxiliary motors , Arno, Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pneumatic valves)		
ELEC-EMU- 1.4	Maintenance schedules, critical points, settings and tolerance of major EMU equipments		
ELEC-EMU- 1.5	Testing, erection and commissioning of major EMU equipments		
	Training in other related streams	**2 W**	**Elec. Trg. Centre**

ELEC-Loco 1.1	Over view of Power , auxiliary and control circuit		
ELEC- Loco 1.2	Names, sizes, location of major equipments of Elec Loco Three phase Loco / Conventional		
ELEC-Loco 1.3	Maintenance schedules, critical points, settings and tolerance of major Loco equipments Three phase / Conventional		
ELEC-Loco 1.4	Testing, erection and commissioning of major Loco Equipments Three phase / Conventional		
	Practical training in EMU/MEMU Three phase / Conventional	**12W**	**Sheds/Shops**
	Technical tour	**2 W**	**Visit to Equipment Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
ETECH EMU 5	Examination	**1 W**	**Elec. Trg. Centre**
	Total	**(26 W)**	

(Elect 28)

DEPARTMENT: Electrical
Activity Centre: EMU
Trade: Apprentice Technician EMU/MEMU

Stage: - Initial Training Course for Apprentice Technician EMU/MEMU (Non-ITI)
Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Duration	Place
	Foundation Course	**3 W**	**Elec. Trg. Centre**
Elect-01	Foundation, measuring/Portable tools, safety, First aid, Fire Fighting, material handling& storage, proper up keep of work area.		
ELEC-1.2	General Electrical technology, and definitions of electrical terms		
ELEC-1.3	Reading of drawing, circuit diagrams		
ELEC-1.4	Basic properties of Electrical Materials,		
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Theory	**4 W**	**Elec. Trg. Centre**
	Workshop Technology (Welding, Carpentry, Painting, Soldering, Machine Shop)- Practical	**4 W**	**Shops**
	Theoretical Training in the allotted streams	**4 W**	**ETC**
ELEC- EMU-1.1	Rake formation, classification of coaches,		
ELEC-EMU 1.2	Over view of Power , auxiliary and control circuit		
ELEC-EMU- 1.3	Names, sizes, location of major EMU/MEMU equipments Three phase Or Conventional (Type available in Shed) (Power transformers, circuit breaker, Panto, traction and auxiliary motors , Arno, Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pneumatic valves)		
ELEC-EMU- 1.4	Maintenance schedules, critical points, settings and tolerance of major EMU/MEMU equipments Three phase Or Conventional (Type available)		
ELEC-EMU- 1.5	Testing, erection and commissioning of major EMU/MEMU equipments Three phase Or Conventional (Type available)		

	Training in other related stream	**2 W**	**Elec. Trg. Centre**
ELEC LOCO 1.1	Power Control and Aux circuit		
ELEC- Loco 1.2	Names, sizes, location of major equipments of Loco		
ELEC-Loco 1.3	Maintenance schedules, critical points, settings and tolerance of major Loco equipments		
ELEC-Loco 1.4	Testing, erection and commissioning of major Loco equipments		
	Practical training in EMU/MEMU	**56 W**	**Sheds/ Shops**
	Technical tour	**2 W**	**Visit to Equip Manufacturer**
	Training in Computers	**2 W**	**Trg. Centre/ Computer Centre**
	Examination	**1 W**	**Elec. Trg. centre**
	Total	**78 W**	

(Elect 29)

DEPARTMENT: Electrical
Activity Centre: EMU
Trade: Technician EMU

Three phase / Conventional as available in the particular shed in all modules.

(Periodicity once in 5 years)

Stage:- Refresher Course for Artisans (Technician EMU)

Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Description	Days
ELEC-1.1	Basic Knowledge about tools, safety, First aid, material handling& storage, proper up keep of work area.	
ELEC-1.2	General Electrical technology, and definitions of electrical terms	
ELEC-1.3	Reading of drawing, circuit diagrams	
ELEC-1.4	Basic properties of Electrical Materials,	
ELEC-EMU-1.3	Names, sizes, location of major Electric loco equipments (Power transformers, circuit breaker, Pan to, Relays, line and auxiliary contactors, Batteries, MP, head light and marker light, bogie, wheels, couplers, brake rigging, compressor, exhausters and pne umatic valves	
ELEC-EMU 1.4	Maintenance schedules, critical points, settings and tolerance of major EMU equipments	
ELEC-EMU 1.5	Testing, erection and commissioning of major EMU equipments	
ELEC-EMU1.6	Codes/Manuels/SMIs/MIs on EMU/MEMU	
ELEC-EMU-1.7	Case studies on failures of EMU /MEMU	
	Test/Feedback	
	Total	**02 Weeks**

(Elect 30)

DEPARTMENT: Electrical
Activity Centre: EMU
Trade: Supervisors(EMU)

Three phase / Conventional as available in the particular shed in all modules.

Stage:- Promotional Course from Gr.I Artisans to Supervisors(EMU)

Place : All these courses will be conducted at concerned Division/BTC/Zonal ETC

Module No.	Module Descript ion	Duration
Elec- 01	Introduction to railway organization and electric department set up	
Elec- 2.1	General Electrical technology, measuring tools/equipments	
Elec –2.2	Safety Rules, precautions, earthling of equipment, accidents, fire fighting, First Aid	
Elec-2.3	Material handling, jigs and fixtures, up keep of work environment	
Gen -2..1	,Material Management (Store procurement , up keep, records, inventory management	
Gen -2.2	Industrial Management,(DAR, Leave/Pass Rules)	
Gen -2.3	Financial management (Railway Accounting and Financial procedures	
Gen -2.4	Energy conservation.	
Elec- 2.4	Codes/ Manuals /SMIs/MIS, pertaining to EMU	
Elec-EMU-1.1	Rake formation and electric fittings	
Elec-EMU-2.2	Maintenance Schedules and overhauling Of EMU equipment viz. TFP, TM, DJ, contactors, relays, lights, arno, auxiliary machines	
Elec-EMU-2.3	Maintenance Schedule and overhauling of Mechanical equipment viz bogies, suspension, brake rigging, wheels, gears, couplers	
Elec-EMU-2.4	Maintenance Schedule and overhauling of compressor, exhauster, valves, panto	
Elec-EMU-2.5	Inspection schedules of Officers/ Supervisors , check lists of EMU	
Elec-EMU-2.6	Testing/erection/ commissioning of various EMU equipment	
Elec-EMU-2.7	Failure investigation/case studies on EMU	
Genl-2.5	Disaster management	
	Test/Feedback	
	Total	**3 Weeks**

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