



भारत सरकार / GOVERNMENT OF INDIA
रेल मंत्रालय / MINISTRY OF RAILWAYS
(रेलवे बोर्ड / RAILWAY BOARD)



International Year
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The Director General,
IRIMEE/Jamalpur.
IRIEEN/Nasik.

Sub: Review of Induction Programme Syllabus for Group 'B' officers of Mechanical, Electrical and Stores Department.

Keeping in view of rapid stride in technological upgradation and evolving technologies and to equip newly promoted Group 'B' officers with necessary knowledge, skill and orientation required to handle multi-disciplinary responsibilities, revised 6 weeks syllabus/modules for Mechanical, Electrical and Stores departments have been developed with the approval of the Board (M/TRS & DG/HR).

The updated set of training modules are enclosed as Annexure-I, II & III, which may be used for Induction Programme for Group 'B' officers of the respective departments.

Encls.: Annexure-I, II & III.

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Copy to:

- 1) The General Managers, All Zonal Railways/PUs.

Group 'B' Induction Programme
Detailed Syllabus (Six Weeks)
(Mechanical Department)

Summary of Six weeks Group 'B' Induction Programme for Mechanical Department

SN	Topic		Allotted Hours	Total
	General			
	(i)	Establishment	14	
	(ii)	Finance	20	
	(iii)	Ethics, RTI & Railway Act	12	
	(iv)	Safety & Train Operation	12	
	(v)	Project Planning	6	
	(vi)	IT & Other New Topics	18	
	Total			82
2	Technical			
	(i)	Diesel Loco	18	
	(ii)	Wagon	12	
	(iii)	Coaching (LHB)	28	
	(iv)	DPRS, Train Set, Vande Bharat	30	
	(v)	Condition Monitoring System (Onboard & Way side)	2	
	Total			90
3	Misc			
		Registration	2	
		Evaluation	4	
	Total			180 Hrs

	Management Topics and others (3-weeks)	Duration
1. Establishment		
1.1	Conduct Rules	2 Hrs
1.2	DAR	2 Hrs
1.3	Reservation Policy	2 Hrs
1.4	Selection, Trade Test & Promotions (Gaz. & Non Gaz.)	2 Hrs
1.5	Gender Sensitization	2 Hrs
1.6	HOER	2 Hrs
1.7	HRMS	2 Hrs
	Total	14 Hrs
2. Finance		
2.1	Functions of Accounts	2 Hrs
2.2	Accounts Classification & Budgetary Control	2 Hrs
2.3	Imprest & Local Purchase; Inspection Audit Stock sheet	2 Hrs
2.4	Financial Aspects Tender & Contracts	2 Hrs
2.5	Railway Budget Macro view	2 Hrs
2.6	IPAS & AIMS	2 Hrs
2.7	Sources of Finance In IR	2 Hrs
2.8	Costing of activities In Workshop	2 Hrs
2.9	WMS and Workshop Accounting systems and distinction of expenditures chargeable to WMS/cost of production/ work order system of workshops	2 Hrs
2.10	Estimate Preparation	2 Hrs
	Total	20Hrs
3. Ethics ,RTI& Railway Act		
3.1	Presentation skills	2 Hrs
3.2	Ethics	2 Hrs
3.3	RTI	2 Hrs
3.4	Railway Act	2 Hrs
3.5	Subordinate Ledislation , (i)Rules for opening (ii) PC-6 (iii)Sanction of Rolling Stock for operation	2 Hrs
3.5	Rajbhasha	2 Hrs
	Total	12 Hrs
4. Safety& Train Operation		
4.1	Inspection & Footplate	2 Hrs
4.2	Safety scenario/ conducting accident enquiries	2 Hrs
4.5	Train Operation-1- Control working, Reciept and Dispatch of Train	2 Hrs
4.6	Train Operation-2- Working Time Table , Emergency Train operation, Different Memo for Shunting	2 Hrs
4.7	Train Operation 3- Signal Interlocking ,Role of SM/Pointsman/Guards/Signal maintainers etc.	2 Hrs
4.8	Policy framework for clearance / sanction of Rolling stock	2 Hrs

	operation	
	Total	12Hrs
5. Project Planning		
5.1	Introduction to Capital Expenditure and planning of works in RSP M&P, PH-41, PH-42	2 Hrs
5.2	Financial appraisal of Projects, Financial Internal Rate of Return & Economic Internal Rate of Return	2 Hrs
5.3	Preparation of Estimates , Abstract and Revised Estimates, Material Modification	2 Hrs
		6 Hrs
	Total	
6.IT and other New Topics		
6.1	Introduction to IT Portals in Railways	2 Hrs
6.2	Cyber security	2 Hrs
6.3	Introduction and use of E office	2 Hrs
6.4	Vigilance Module; an Introduction	2 Hrs
6.5	Communication skills	2 Hrs
6.6	Project Presentation	4 Hrs
6.7	GCC, SBD and Planning of Service Contract for EnHM Activities	2 Hrs
6.8	EnHM activities like OBHS, CTS, Watering & Linen Management	2 Hrs
		18 Hrs
	Technical Topics (3-weeks)	Duration
1. Diesel & Wagon (1-week)		
1.1	Introduction to GM/HHP Loco & Need	2 Hrs
1.2	Major Mechanical system of HHP/ GM loco-I (LOS & WCS)	2 Hrs
1.3	Major Mechanical system of HHP/ GM loco-II (FOS & Charge Air System)	2 Hrs
1.4	Basic Layout and major components of GM Locos	2 Hrs
1.5	Rotating Machines - HHP	2 Hrs
1.6	CCB & Water cooled Compressor	2 Hrs
1.7	IGBT Based transmission & control system of HHP	2 Hrs
1.8	LOCO BOGIE	2 Hrs
1.9	Downloading and understanding different fault log/events from brake system/propulsion/	2 Hrs
1.10	Overview of Freight Operations over IR, Mission 6MT/day	2 Hrs
1.11	Air Brake system in wagon	2 Hrs
1.12	Recent Development in Freight Stock	2 Hrs
1.13	Bogie and Suspension of Freight Stock	2 Hrs
1.14	APM, LSD, Empty/ Load Box Device, OMRS, WILD, NAHW & Smart Yard	2 Hrs
1.15	Wagon Operation and NRP-2030	2 Hrs
	Total	30 Hrs
2. LHB (1-week)		
2.1	Air Suspension System & FIBA	2 Hrs

2.2	Brake System of LHB Coaches	2 Hrs
2.3	WSP & Wheel Shelling	2 Hrs
2.4	Couplers of LHB coach	2 Hrs
2.5	Air Suspension System & FIBA	2 Hrs
2.6	LHB Spring Failure Analysis-I	2 Hrs
2.7	LHB Spring Failure Analysis-II	2 Hrs
2.8	Fire Safety in LHB Coaches	2 Hrs
2.9	Air Conditioning System in LHB Coaches	2 Hrs
2.1	Train lighting System in LHB coaches, EOG & HOG Systems	2 Hrs
2.11	FIAT Bogie and Components	2 Hrs
2.12	Condition Monitoring Systems (Both On Board & Way Side)	2 Hrs
2.13	Coach Maintenance Planning in Division	2 Hrs
2.14	Electrical Systems of LHB	2 Hrs
2.15	Enroute Attention-Rolling in, Engine Attention, Turn Round & Breakdown activities	2 Hrs
	Total	30 Hrs
3. Trainset (1-week)		
3.1	Introduction to DPRS	2 Hrs
3.2	High speed rail rolling stock technology & MAHSR	2 Hrs
3.3	Design & Layout of Vande Bharat Coaching Depot	2 Hrs
3.4	Vande Bharat Trainset en-route trouble shootings	2 Hrs
3.5	Trainset Auxiliary Power System	2 Hrs
3.6	HVAC system in Trainset	2 Hrs
3.7	Basics of electrical traction distribution-1	2 Hrs
3.8	Basics of electrical traction distribution-II	2 Hrs
3.9	Conventional EMU basics	2 Hrs
3.1	EMU/MEMU maintenance schedule and infrastructure	2 Hrs
3.11	3 Phase EMU	2 Hrs
3.12	EMU Air brakes & EP brakes	2 Hrs
3.13	Maintenance and troubleshooting of EMU/MEMU	2 Hrs
3.14	VVVF experiment at Mechatronics Lab	2 Hrs
3.15	PA/Pls System CCTV system Smoke Detection System	2 Hrs
	Total	30 Hrs

**Group 'B' Induction Programme
Detailed Syllabus (Six Weeks)
(Electrical Department)**

Summary of Six week Group 'B' induction program for Electrical Department

SN	Topic		Allotted Hours
1	General		
	(i)	Establishment	14
	(ii)	Finance	22
	(iii)	Ethics, RTI & Railway Act	12
	(iv)	Safety	14
	(v)	Project Planning	6
	(vi)	IT & Other New topics, Stores related IT applications	14
	Total		82
2	Technical		
	(i)	TRS & EMU	16
	(ii)	TRO	10
	(iii)	TRD	18
	(iv)	Power Electronics & 3 Phase Loco	18
	(v)	Condition Monitoring	04
	(vi)	General Services	12
	(vii)	TLAC & LHB Coaches	08
	(viii)	Computer	04
	Total		90
3	Miscellaneous		
	(i)	Registration/ valedictory	2
	(ii)	Evaluation	6
	Grand Total		180 Hrs

	Management Topics and others (3-weeks)	Duration
1. Establishment		
1.1	Conduct Rules	2 Hrs
1.2	DAR	2 Hrs
1.3	Reservation Policy	2 Hrs
1.4	Selection, Trade Test & Promotions (Gaz. & Non Gaz.)	2 Hrs
1.5	Gender Sensitization	2 Hrs
1.6	HOER	2 Hrs
1.7	HRMS	2 Hrs
	Total	14 Hrs
2. Finance		
2.1	Functions of Accounts	2 Hrs
2.2	Accounts Classification & Budgetary Control	2 Hrs
2.3	Imprest & Local Purchase; Inspection Audit Stock sheet	2 Hrs
2.4	Financial Aspects Tender & Contracts	2 Hrs
2.5	Railway Budget Macro view	2 Hrs
2.6	IPAS & AIMS	2 Hrs
2.7	Workshop Accounting	2 Hrs
2.8	Sources of Finance in IR	2 Hrs
2.9	Costing of activities in Workshops	2 Hrs
2.10	Pink book, LAW book, Mini law book, Umbrella works. Working on IRPSM	2 Hrs
2.11	Tenders and contracts - how to prepare tender documents, scope of works, special conditions, payment terms etc.	2 Hrs
	Total	22 Hrs
3. Ethics, RTI & Railway Act		
3.1	Presentation skills	2 Hrs
3.2	Ethics	2 Hrs
3.3	RTI, IREPS	2 Hrs
3.4	Railway Act	2 Hrs
3.5	Subordinate Legislation, (i) Rules for opening (ii) PC-6 (iii) Sanction of Rolling Stock for operation	2 Hrs
3.6	Rajbhasha Act	2 Hrs
	Total	12 Hrs
4. Safety		
4.1	Inspection & Footplate, Accident Manuals	2 Hrs
4.2	Safety scenario/ conducting accident enquiries	2 Hrs
4.3	Disaster/ Breakdown Management	4 Hrs

4.4	Interdepartmental Topics, items like track parameters/formation, Automatic Signaling, signal interlocking, signal visibility and working during signal failures, different memos for shunting, attending signal failures, receive and dispatch of trains, role of SM/Pointsman/Guards/Signal maintainers etc.	4 Hrs
4.5	Policy framework for clearance / sanction of Rolling stock operation	2 Hrs
	Total	14 Hrs
5. Project Planning		
5.1	Introduction to Capital Expenditure and planning of works in RSP, M&P, PH-35, PH-36	2 Hrs
5.2	Financial appraisal of Projects, Financial Internal Rate of Return & Economic Internal Rate of Return	2 Hrs
5.3	Preparation of Estimates, Abstract and Revised Estimates, Material Modification EPS & Non-EPS contracts, Arbitration	2 Hrs
	Total	06 Hrs
6. IT and other New Topics		
6.1	Introduction to IT Portals in Railways (GeM, UDM, IREPS & UGM).	2 Hrs
6.2	Cyber security	2 Hrs
6.3	Introduction and use of E office	2 Hrs
6.4	Vigilance Module; an Introduction	2 Hrs
6.5	Communication skills	2 Hrs
6.6	Project Presentation	4 Hrs
	TOTAL	14 Hrs
	Technical Topics (3-weeks)	Duration
	1. TRS & EMU	(16 hours)
1.1	Introduction Loco (Three phase & Conventional)	2 Hrs
1.2	Mechanical System and Braking system of locos(IRAB, and EMU, Trainsets	2 Hrs
1.3	Electrical control system of conventional loco	2 Hrs
1.4	Electrical Power & Aux system of conventional loco	2 Hrs
1.5	Traction motor drive system (DC and 3-phase SCIM)	2 Hrs
1.6	Power Equipments of 3 phase MEMU/EMU/Train sets	2 Hrs
1.7	Working of CVVRS, DPWCS, EOTT, Cab AC, VCD	2 Hrs
1.8	Working of RTIS, TCAS, SLAM, etc.	2 Hrs
	Total	16 Hrs

2. TRO (10 hours)		
2.1	Organization and Loco Pilot categorization	2 Hrs
2.2	Crew Link, Loco Link, Loco Pilot duty/Rest rules, Power plan	2 Hrs
2.3	CMS, ICMS, G & SR	2 Hrs
2.4	Operation of long hauls, bankers in Ghat sections., Foot plate inspection	2 Hrs
2.5	Electrical Fire and safety related topics.	2 Hrs
	Total	10 Hrs
3. TRD (18 hours)		
3.1	OHE Basics, 1X25 KV	2 Hrs
3.2	2X25 KV OHE	2 Hrs
3.3	Foundations & Masts, Bonding & Earthing	2 Hrs
3.4	Principles of layout, Turn out, Cross over, OHE Maintenance schedule Neutral sections--PTFE various types	2 Hrs
3.5	Panto Entanglement cause & remedies, Breakdown Maintenance	2 Hrs
3.6	Power supply feeding arrangement in TSS,SSP,SP	2 Hrs
3.7	Protection scheme & SCADA, Numerical protective relays-Transformer, OHE & Capacitive bank protection schemes for 1x25kV, 2x25kV systems. PSI Maintenance schedule, Latest development &SMLs	2 Hrs
3.8	Open Access, Power planning & Scheduling , ABT meters and their importance, Tariffs	2 Hrs
3.9	EIG for Railway, its role and application law/rules	2 Hrs
	Total	18 Hrs
4. Power Electronics & 3-phase Loco (18 hours)		
4.1	Passive and active components resonance, filters, Semiconductor switches, IGBT and GTO	2 Hrs
4.2	Power and Aux. Converters of WAG-9H/WAP-7, D-9, (9000 HP Siemens electric locomotive Dahod), EF-12K and Battery charging circuits.	2 Hrs
4.3	Rectifier/Inverters, 25KVA Inverters, HOG converters	2 Hrs
4.4	Electric Drives & PWM techniques for traction and regenerative braking.	2 Hrs
4.5	Electrical Fire and safety in 3-phase Locos.	2 Hrs
4.6	Data analysis & fault diagnostics in 3-phase Locos.	2 Hrs
4.7	New trend in 3-phase technology, reliability issues.	2 Hrs
4.8	Bogie & TM 3 phase	2 Hrs
4.9	Pneumatic system of IRAB2 and Three Phase Locomotives CCB, E70 and ESCORTS)	2 Hrs
	Total	18 Hrs
5. Condition Monitoring (CM) (04 hours)		
5.1	Condition Monitoring of Electrical Equipment, Insulation Oil, Cables & Transformers	2 Hrs
5.2	Non-Destructive testing (NDT), Ultrasonic testing & liquid penetrant testing, Magnetic Penetration Testing. Predictive maintenance of OHE using AI based monitoring, such as DPT, MPT, DGA etc.	2 Hrs
	Total	04 Hrs
6. General Service (GS) (12 hours)		
6.1	Organization Set Up, Power supply Distribution system, Types of pumps & Selection	2 Hrs
6.2	Earthing and Electrical Fire safety,	2 Hrs
6.3	LED lighting	2 Hrs

6.4	Building Air Conditioning , EC Act-2003, CEAR-2023	2 Hrs
6.5	Energy Efficiency Policy, Energy Conservation Measures Renewable power obligations.	2 Hrs
6.6	Super ECNC Norms, Sunya plus Certification, NBC norms for buildings & Fire safety.	2 Hrs
	Total	12 Hrs
7. TLAC & LHB Coaches (08 hours)		
7.1	Train lighting (TL) System, General Scheme for power generation & Distribution, ERRU & RRU, Maintenance of TL system, Failure analysis of TL coaches	2 Hrs
7.2	Air-conditioning of LHB Coaches, RMPU, Pantry Car, Power Car	2 Hrs
7.3	Preventive Maintenance, maintenance Schedule of LHB Coaches, Train Sets and Kolkata Metro coaches,	2 Hrs
7.4	Comparison of TLAC & LHB Coaches, CCTV, Electrical safety and Fire safety.	2 Hrs
	Total	08 Hrs
8. Computer (04 hours)		
8.1	MS word & Excel (Edit, Formatting, Basic Formula, Chart, edit chart	2 Hrs
8.2	MS PPT(Edit, Formatting, insert table, insert chart, insert picture, animation, Applying design & slide show.	2 Hrs
	Total	04 Hrs

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**Group 'B' Induction Programme
Detailed Syllabus (Six Weeks)
(Stores Department)**

Summary of Six week Group 'B' induction program for Stores Department

SN	Topic		Allotted Hours
1	General		
	(i)	Establishment	14
	(ii)	Finance	22
	(iii)	Ethics, RTI & Railway Act	12
	(iv)	Safety	14
	(v)	Project Planning	6
	(vi)	IT & Other New topics, Stores related IT applications	14
	Total		82
2	Technical		
	(i)	Depot Matters	16
	(ii)	Basics of Procurement	06
	(iii)	Handling of Stores Tenders	30
	(iv)	Procurement of goods & services through GeM	14
	(v)	Handling of Service Tenders	04
	(vi)	Contract Management	04
	(vii)	Divisional Management	02
	(viii)	Stores Finance	04
	(ix)	Working on procurement portals	04
	(x)	Monitoring in Stores Working	04
	(xi)	Preventive Vigilance	02
	Total		90
3	Miscellaneous		
	(i)	Registration/ valedictory	2
	(ii)	Evaluation	2
	(iii)	Field/Industrial Visit	4
	Grand Total		180 Hrs

Draft syllabus of IC (Stores) General Topics 3 Weeks

Management Topics and others (3-weeks)		Allotted Hours
1. Establishment		
1.1	Conduct Rules	2
1.2	DAR	2
1.3	Reservation Policy	2
1.4	Selection, Trade Test & Promotions (Gaz. & Non Gaz.)	2
1.5	Gender Sensitization	2
1.6	HOER	2
1.7	HRMS	2
	Total	14
2. Finance		
2.1	Functions of Accounts	2
2.2	Accounts Classification & Budgetary Control	2
2.3	Imprest & Local Purchase, Inspection Audit Stock sheet	2
2.4	Financial Aspects Tender & Contracts	2
2.5	Railway Budget Macro view	2
2.6	IPAS & AIMS	2
2.7	Workshop Accounting	2
2.8	Sources of Finance in IR	2
2.9	Costing of activities in Workshops	2
2.10	Pink book, LAW book, Mini law book, Umbrella works, Working on IRPSM	2
2.11	Tenders and contracts-how to prepare tender documents, scope of works, special conditions, payments terms, etc.	2
	Total	22
3. Ethics ,RTI & Railway Act		
3.1	Presentation skills	2
3.2	Ethics	2
3.3	RTI	2
3.4	Railway Act	2
3.5	Subordinate Legislation , (i) Rules for opening (ii) PC-6 (iii) Sanction of Rolling Stock for operation	2
3.5	Rajbhasha	2
	Total	12
4. Safety		

4.1	Inspection & Footplate, Accident Manuals	2
4.2	Safety scenario/ conducting accident enquiries	2
4.3	Disaster/ Breakdown Management	4
4.4	Interdepartmental Topics, items like track parameters/formation, Automatic signaling, signal interlocking, signal visibility and working during signal failures, different memos for shunting, attending signal failures, receive and dispatch of trains, role of SM/Pointsman/Guards/Signal maintainers etc.	4
4.5	Policy framework for clearance/sanction of Rolling stock operation	2
	Total	14
5. Project Planning		
5.1	Introduction to Capital Expenditure and planning of works in RSP, M&P, PH-35, PH-36	2
5.2	Financial appraisal of Projects, Financial Internal Rate of Return & Economic Internal Rate of Return	2
5.3	Preparation of Estimates, Abstract and Revised Estimates, Material Modification, EPS & Non-EPS contracts, Arbitration	2
	Total	06
6. IT and other New Topics		
6.1	Introduction to IT Portals in Railways	2
6.2	Cyber security	2
6.3	Introduction and use of E office	2
6.4	Vigilance Module; an Introduction	2
6.5	Communication skills	2
6.6	Project Presentation	4
	Total	14
	TOTAL (1+2+3+4+5+6)	82

Draft syllabus of IC (Stores) Technical Topics 3 Weeks

S.N.	Technical Topics	Allotted Hours
1	Depot Matters	16
1.1	Overview, Major Functions, Layout	2
1.2	Receipt of Stores and initial rejection of Stores	2
1.3	Storage and Preservation of Stores, Theft & Fire Prevention	2
1.4	Ledger Section Working; Concepts of quantity review	2
1.5	Returned Stores & Scrap Disposal	2
1.6	Local Purchase	2
1.7	Handling of Warranty Rejections	2
1.8	Warehouse Design & Planning	2
2	Basics of Procurement	06
2.1	Contract Act, MSMED Act-Salient Provisions	2
2.2	IRS Conditions of Contract	4
3	Handling of Stores Tenders	30
3.1	Standard Bid Document	4
3.2	Provisions of MSOP	2
3.3	Processing of Tenders-Purchase Proposal, Tender Schedule & Settlement	6
3.4	Handling of NS Demands	2
3.5	MSE Purchase Preference & Make in India Policy	2
3.6	Case Studies involving MSE-PP and applicability of MII	2
3.7	Important Circulars of Railway Board related to Procurement	4
3.8	Procurement of Engineering Items	2
3.9	Procurement of Medicines	2
3.10	Procurement of M&Ps	2
3.11	Preparation of Tender Acceptance Note	2
4	Procurement of goods & services through GeM	14
4.1	Overview of GeM, Mandate for GeM-GFR	2
4.2	Direct Purchase through GeM	4
4.3	Bidding in GeM	4
4.4	GeM GTC	2
4.5	Handling of Accountal/Service Acceptance & bill processing in GeM	2
5	Handling of Service Tenders	4
5.1	IR GCC for Services	2
5.2	Case Studies	2
6	Contract Management	4
6.1	Concepts of SVC, PVC & Option Clause	2
6.2	Contract Modifications including its cancellation	2
7	Divisional Working	2
7.1	Organisation & Functioning	2
8	Stores Finance	4
8.1	Suspense Heads & Clearance	2

8.2	Store Budget	2
9	Working on procurement portals	4
9.1	IREPS, MMIS & UDM	2
9.2	UVAM-Utility in tender decision	2
10	Monitoring	4
10.1	Inventory Control	2
10.2	Monitoring of Key Performance Indicators	2
11	Preventive Vigilance	2
11.1	Preventive Vigilance in Stores working	2
	TOTAL (1+2+3+4+5+6+7+8+9+10+11)	90