Programme Handbook

ITS Group ‘A’ Officer Trainees

Induction Training

National Telecommunications Institute for Policy Research, Innovation and Training

Department of Telecommunications, Ministry of Communications & IT
ALTTC Campus, Govt of India Enclave, Near Raj Nagar
Ghaziabad-201002, India
Website: www.ntiprit.gov.in
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Appendix: *Shishtachar* booklet
ABOUT NTIPRIT

The National Institute for Policy Research, Innovation and Training, NTIPRIT, Ghaziabad is the premier training institution of the Department of Telecommunications under the Ministry of Communications & IT, Government of India. Initially it was set up as National Telecom Academy (NTA) in 2010 to assist the Govt. to meet the long term requirements of trained personnel for planning, licensing, monitoring and management of the rapidly developing telecommunication network in India. In March 2011, NTA was upgraded to NTIPRIT bringing Policy Research and Innovation under its scope of activities. This Centre imparts technical as well as managerial training to in-service officers of the Department of Telecom and its training expertise is open to other Govt. departments and industry.

NTIPRIT is enlisted as one of the Central Training Institutions (CTIs) in the country by the Department of Personnel & Training, Ministry of Personnel, Public Grievances and Pensions, Govt. of India.

At present, NTIPRIT is operating from ALTTC campus which consists of Administrative and Academic Blocks, Satellite Earth Station, hostels and residential complex spread over 81 acres of land situated in Government of India Enclave, Rajnagar, Ghaziabad. The Institute is nearly 30 Kms from New Delhi Railway Station and about 50 kms from Indira Gandhi International Airport, New Delhi.
FACILITIES AT NTIPRIT-ALTTC CAMPUS

OFFICE COMPLEX: Administrative Block of the ALTTC campus houses, on its eight floors, a good number of fully equipped classrooms with audio-visual aids, a library, a seminar hall, a conference hall to accommodate ninety persons and a canteen. The Academic Block houses laboratories of latest technologies such as NGN, 3G, GSM, CDMA, SDH, DWDM, Broadband etc. A little distance away from these blocks is the Satellite Earth Station easily distinguished by its large antenna disc.

HOSTELS: There are three hostels for course participants namely, J.C.Bose Hostel, Raman Hostel and Bhabha hostel. Residence in the campus is compulsory for the Officer Trainees under probation. Permission to stay outside will be accorded only under the most compelling circumstances. Families and guests are not allowed to stay in the hostels.

AUDITORIUM: The campus has a state-of-the-art, multipurpose auditorium named C.K. Reddi Hall with a seating capacity of about five hundred. All landmark events of campus are held here and it has a rich heritage of hosting some of the finest artistes of the world and leading personalities who have been successful in their respective fields.

SHOPPING CENTRE: A small shopping centre with few shops and a bank is situated between the colony and hostels to cater to both the residents and trainees.

SPORTS FACILITIES: The campus provides various sports and recreation facilities for the trainee officers and faculty members. There are two Tennis courts as well as Volleyball and Basketball courts all of which are located close to the hostels. The student centre provides facilities for Table Tennis, Billiards, Chess, Carom, Cards etc. Adjoining the Student Centre is a Gymnasium Hall, which houses two indoor Badminton Courts, being another attraction for the trainees. A Cricket ground and a Football field with athletic track are also available in the campus.
ABOUT THE INDUCTION TRAINING PROGRAMME

OBJECTIVES: The purpose of this course is to prepare the ITS Group ‘A’ Officer Trainees(also referred to as OTs in this handbook), under probation, for handling various duties assigned in Department of Telecommunications such as, office administration, licensing functions, telecom enforcement & monitoring, PSU coordination, standardisation & framing of specifications/ standards for telecom network and equipment etc. It also provides a strong foundation through specialised training in telecom technologies. This course exposes the participants to the fundamentals for telecom administration covering macro environment as well as the departmental rules. Apart from above, the Officer Trainees learn the fundamentals & basics of telecommunication infrastructure. The course also helps the Officer Trainees to learn managerial skills and information technology for office working.

CONTENT: The Programme broadly comprises classroom modules at NTIPRIT and other institutions, field visits, and field attachment to various units of DoT, its PSUs, TEC, TERM Cells and TRAI.

The description of training modules, given in this handbook, is indicative only. The training structure, sequence of training modules and field attachments, their contents and duration may be changed at any stage to cover the latest developments and emerging needs or due to other administrative reasons.
SCHEDULE OF THE TRAINING AND FIELD ATTACHMENT PROGRAMME

The schedule of the training and field attachment programme shall be as under:

<table>
<thead>
<tr>
<th>S. No</th>
<th>Topic</th>
<th>Duration in week(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Administration &amp; Establishment (Four weeks)</td>
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</tr>
<tr>
<td>1.1</td>
<td>Orientation Programme</td>
<td>1</td>
</tr>
<tr>
<td>1.2</td>
<td>Administrative Rules</td>
<td>1</td>
</tr>
<tr>
<td>1.3</td>
<td>Establishment</td>
<td>1</td>
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<tr>
<td>1.4</td>
<td>Vigilance and Disciplinary Proceedings</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Foundation Course (LBSNAA/ ATIs/ Other reputed Management Institutions)</td>
<td>15</td>
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<tr>
<td>3</td>
<td>Telecom &amp; Network Technologies-I (Seventeen weeks)</td>
<td></td>
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<tr>
<td>3.1</td>
<td>Switching Module</td>
<td></td>
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<tr>
<td>3.1.1</td>
<td>PSTN Switching Module</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Telecom Infrastructure</td>
<td>1</td>
</tr>
<tr>
<td>3.2</td>
<td>Data Communications</td>
<td>4</td>
</tr>
<tr>
<td>3.3</td>
<td>NGN</td>
<td>1</td>
</tr>
<tr>
<td>3.4</td>
<td>Mobile communications (Part-1)</td>
<td></td>
</tr>
<tr>
<td>3.4</td>
<td>(GSM &amp; CDMA, WCDMA)</td>
<td>5</td>
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<tr>
<td>3.5</td>
<td>Transmission</td>
<td></td>
</tr>
<tr>
<td>3.5.1</td>
<td>Optical communications</td>
<td>2</td>
</tr>
<tr>
<td>3.5.2</td>
<td>Radio communications</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Satellite communications</td>
<td>1</td>
</tr>
<tr>
<td>4</td>
<td>DoT Functions (Five weeks)</td>
<td></td>
</tr>
<tr>
<td>4.1</td>
<td>TERM Cell Functions</td>
<td>1</td>
</tr>
<tr>
<td>4.2</td>
<td>Licensing Functions</td>
<td>1</td>
</tr>
<tr>
<td>4.3</td>
<td>Wireless Planning &amp; Spectrum Management</td>
<td>1</td>
</tr>
<tr>
<td>4.4</td>
<td>USO Fund</td>
<td>1</td>
</tr>
<tr>
<td>4.5</td>
<td>TEC functions</td>
<td>1</td>
</tr>
<tr>
<td>5</td>
<td>Regulation &amp; Dispute Settlement</td>
<td>1</td>
</tr>
<tr>
<td>6</td>
<td>Field Attachment Stage-I (TERM Cells)</td>
<td>8</td>
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<tr>
<td>S. No</td>
<td>Topic</td>
<td>Duration in week(s)</td>
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<tr>
<td>7</td>
<td>Telecom &amp; Network Technologies-II (Nine weeks)</td>
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<tr>
<td>7.1</td>
<td>Mobile communications (Part-2) (WiMax, LTE and advanced technologies)</td>
<td>4</td>
</tr>
<tr>
<td>7.2</td>
<td>Lawful Interception and Monitoring</td>
<td>1</td>
</tr>
<tr>
<td>7.3</td>
<td>Structure of Networks, Interconnection &amp; Service Provisioning</td>
<td>1</td>
</tr>
<tr>
<td>7.4</td>
<td>Cyber Security</td>
<td>3</td>
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<tr>
<td>8</td>
<td>Disaster Management (3 days)</td>
<td>1</td>
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<tr>
<td></td>
<td>Ethics in Public Administration (2 days)</td>
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<tr>
<td>9</td>
<td>Study visit to Major Telecom Installations, Telecom Industries and TERM Cells</td>
<td>2</td>
</tr>
<tr>
<td>10</td>
<td>North-East study visit</td>
<td>1</td>
</tr>
<tr>
<td>11</td>
<td>Project Report submission and Presentation</td>
<td>1</td>
</tr>
<tr>
<td>12</td>
<td>Hindi (Raj Bhasha)</td>
<td>1</td>
</tr>
<tr>
<td>13</td>
<td>Attachment to DoT H/Q and TEC</td>
<td>5</td>
</tr>
<tr>
<td>14</td>
<td>Attachment to TRAI</td>
<td>1</td>
</tr>
<tr>
<td>15</td>
<td>Attachment to C-DoT and BBNL</td>
<td>1</td>
</tr>
<tr>
<td>16</td>
<td>Joining time before Field Attachment</td>
<td>1</td>
</tr>
<tr>
<td>17</td>
<td>Field Attachment to BSNL/ MTNL</td>
<td>8</td>
</tr>
<tr>
<td>18</td>
<td>Field Attachment Stage-2(DoT Units)</td>
<td>21</td>
</tr>
<tr>
<td>19</td>
<td>Valedictory and Professional Exam</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>Total duration (in weeks)</td>
<td>104</td>
</tr>
</tbody>
</table>

The individual course details and contents are covered in the subsequent sections.

Note:
1. The sequence of conduction of individual training modules shall be decided by NTIPRIT, and may not be conducted in the sequence given above.

2. The Hindi exam of the Officer Trainees will also be conducted during the training programme.
Course objectives and contents of various trainings and field attachment modules

SECTION-1

1. ADMINISTRATION & ESTABLISHMENT (4 WEEKS)

1.1 ORIENTATION PROGRAMME

PROGRAMME OBJECTIVES

The objective of the Orientation Programme is to expose the Officer Trainees to the Ministry of Communications & IT, the Telecom Commission, Department of Telecom and its service provider organisations- Bharat Sanchar Nigam Limited (BSNL) & Mahanagar Telephone Nigam Limited (MTNL), other PSUs of DoT, including other units of the Department of Telecommunications such as C-DoT. The Programme also provides an opportunity to the Officer Trainees to meet and interact with the senior officers of the department.

DURATION: 1 Week

CONTENTS:
- Briefing on the Training Programme of the Officer Trainees
- Organisational setup of the Ministry of Communications & IT, Telecom Commission and Department of Telecom.
- Organisational structure and functions of the Telecom Directorate, Telecom Engineering Centre, TERM cells
- History of Telecom and overview of Indian Telecom scenario
- Roles of the public sector organisations of DoT i.e. BSNL, MTNL, BBNL, ITI, TCIL & C-DOT
- Role of TRAI and TDSAT
- International co-operation in the field of telecom, role and functions of ITU, UNDP, and APT
- Innovation in Telecom & ICT
- Policy Analysis & Researching Telecom & ICT
- Telecom Technology trends and role of TCOEs
- Role of Industrial bodies in Telecom sector- COAI, AUSPI, ISPAI, TEMA etc.
- Interaction with senior officers
- Guidelines on conduct, behaviour and etiquette- Shishtachar.

1.2 ADMINISTRATIVE RULES (1 WEEK)

OPERATIONAL
- Administrative Power of officers
- Office Administration
- Office Procedures
- Handling of VIP & court cases
- Handling of Parliament questions
MATERIALS
- Material Management
- Tendering

FINANCIAL ACCOUNTING
- Work Expenditure and Accounting
- DoT Revenue sources
- Work Estimates

FINANCIAL DELEGATION & PROPRIETY
- Delegation of Financial Powers
- Exercise of Financial Powers-Case Studies
- Control of Expenditure

FINANCE ADVICE FOR PROCUREMENT
- Tender Evaluation
- Preventive Vigilance
- DGS&D Procedure

1.3 ESTABLISHMENT (1 WEEK)
- General rules and regulations
- CCS (CCA) Rules, 1965, CCS (Conduct) Rules 1964
- Staff establishment, Appointment and Training
- Organised services and their recruitment
- Reservation Policy
- Promotions, Cadre review
- Office Inspections
- Role & Function of CAT
- Rules relating to Unions & Associations
- Fundamental Rules, Supplementary Rules
- Annual Performance Appraisal
- Leave Rules
- Terminal Benefits
- Medical Rules
- Income Tax

The module maybe conducted together for ITS and P&T Accounts and Finance Service Officer Trainees.

1.4 VIGILANCE & DISCIPLINARY PROCEEDINGS (1 WEEK)

Constitutional provisions, Principles of Natural Justice, CVC, UPSC, CBI setup, Major & Minor penalties, Disciplinary proceedings, Suspension, Dilatory tactics, RTI framework & its impact, Case studies.
SECTION-2

2. FOUNDATION COURSE (at LBSNAA/ ATIs/ other reputed Management Institutes)

DURATION: 15 WEEKS

The Foundation Course is of fifteen weeks duration, and maybe conducted at Lal Bahadur Shastri National Academy of Administration (LBSNAA), Mussoorie or other DoPT designated Administrative Training Institutes (ATIs), or other reputed Management institutions. This programme may be scheduled along with Officer Trainees of IAS or other Central Civil services.

The major objectives of the Foundation Course are the following:

(i) developing an *esprit de corps* among the Officer Trainees of different services,
(ii) fostering the attitudes and values that every civil servant should possess, and
(iii) imparting a basic understanding of the environment, the machinery of the Government and of the subject competencies and skills that the officers have to possess for discharging their duties in the initial years of service.

The curriculum of Foundation course generally consists of 12 weeks Course work and 3 weeks for extra-curricular activities such as trekking, village visits etc.

The Academic sessions under the Course work will follow the following pattern:

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Subject/ Module</th>
<th>No. of Sessions (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Political Concepts and the Constitution of India</td>
<td>20</td>
</tr>
<tr>
<td>2.</td>
<td>Public Administration</td>
<td>60</td>
</tr>
<tr>
<td>3.</td>
<td>Law</td>
<td>40</td>
</tr>
<tr>
<td>4.</td>
<td>Management &amp; Behavioural Sciences</td>
<td>30</td>
</tr>
<tr>
<td>5.</td>
<td>Basic Economics</td>
<td>30</td>
</tr>
<tr>
<td>6.</td>
<td>Information and Communication Technology (ICT)</td>
<td>20</td>
</tr>
<tr>
<td>7.</td>
<td>Indian History and Culture</td>
<td>25</td>
</tr>
<tr>
<td>8.</td>
<td>Language</td>
<td>20</td>
</tr>
</tbody>
</table>

A brief outline of the various topics under the scope of the aforesaid subjects in the Course work is given below:

1. **Political Concepts & Constitution of India**
   - Political concepts
   - Political theories
   - The basic structure of our Constitution
   - Federalism
• Organs of the Govt.
• Role of the Judiciary
• Human rights
• Democratic values
• Fundamental rights and Directive Principles
• Civil services under the Constitution
• India’s Foreign Policy, etc.

2. Public Administration
• Structure of bureaucracy and the challenges faced by the bureaucracy
• Basic administrative skills including-
  • time management
  • delegation
  • conduct of meetings
  • presentation skills
  • report writing
  • noting
  • office procedure
• Governance: Exposure to different areas of governance such as
  • Social Sector
  • Rural Development
  • Science and Technology
  • Public Distribution System
  • Audit
  • Social Audit
  • Budgeting
  • people’s participation in governance
  • innovations in governance
  • e-governance
  • business process re-engineering
  • public-private partnership
  • gender sensitisation
  • weaker sections and the differently-abled persons
  • human element in administration, etc.

3. Law
• Introduction to Law & Sources of Law
• Concept of Law and Judicial System
• Civil Procedure Code (CPC)
• Law of Torts
• Consumer Protection Act
• Specific Relief Act and Arbitration Act
• IPC: General Principles
• Principles of Natural Justice
• Judicial Review of Administrative Action
• Criminal Procedure Code (Cr PC)
• Contempt of Court
• Suits by or against Government
• Liability of Government Servants in Contracts and Torts
• Law of Contract
• Contempt of Lawful Authority of Public Servants
• Rule of Law
• Principles of Administrative Law, Administrative Discretion
• Inquiry by Domestic Tribunal
• Legal Remedies including Writs
• Sexual Harassment of Working Women, etc.

• Indian Company Act
• Labour Law & Trade Unions
• Industrial Dispute Act
• FDI policy, acts & regulations
• Tax Laws- Sales Tax/ Service Tax/ VAT, etc.

4. Management and Behavioural Sciences

Basic Principles
• Schools of Management thoughts
• Management Systems & Processes

Project Management
• Project Formulation and Appraisal
• PERT-CPM
• Resource Analysis
• Risk and Uncertainty in Project Management
• Risk Sharing

Quantitative Techniques in Management
• Data Analysis
• Sampling and Sampling Distribution

Operation Research & MIS
• Operation Research & Management Decision Making
• Operation Research Techniques & Models
• Research Methodology
• Management Information Systems

Behavioural Sciences
• Introduction to Organisational Behaviour
• Motivation
• Group dynamics
• Team building
• Decision Making
• Organisational Leadership
• Principle Centered Negotiation and Conflict Resolution
• Transactional Analysis
• International Negotiation

12
Self- awareness
  • Personality & Behaviour

Communication
  • Interpersonal Communication
  • Corporate Communication

5. Basic Economics

Managerial Economics & Indian Economy
  • Introduction to Economics
  • Theory of Demand, Supply, Market Structure, Elasticity
  • Structure of Indian Economy
  • Fiscal Policy
  • Resource Mobilization
  • Economic Reforms & Liberalisation
  • International Trade and Balance of Payments
  • WTO
  • Theory of Growth
  • Role of economic conditions in decision making in various sectors

Financial Management
  • Financial Concepts
  • Accounting for Managers
  • Cost Accounting & Transfer Pricing
  • Fund Flow Analysis
  • Ratio Analysis
  • Profit and loss A/C, Balance Sheet
  • Budgeting
  • Public Financial Administration

6. Information and Communication Technology (ICT)
  • Office Productivity software including
    • MS-Word, Excel, Power-Point and MS-Access
  • Database Management systems
    • RDBMS, SQL, Oracle, FoxPro etc.
  • Web designing tools& techniques
  • Networking Concepts and Techniques

7. Indian History and Culture

History
  • Overview of Indian History

Polity and Governance in Indian history
  • The State and Administration in Ancient, Medieval and Modern India
  • Changing fiscal structures
• Resistance against the State
• Indian Nationalism; Gandhi
• Communal Politics, Partition and Independence
• Issues in Economic History
• Issues in Social History
• A brief Introduction to the major religious traditions of India

Culture
• Culture: Meaning, Context and Forms
• Conservation of Heritage
• Art and Architecture
• Literature
• Performing Arts

8. Language

The Officer Trainees will have to learn one language including Hindi or one Indian/Foreign language. Officer Trainees will have to choose from among the language options available at the Institute. There will be a proficiency test of Hindi for all Officer Trainees at the time of joining the Foundation Course. On the basis of this test, the OTs will be split into two streams, i.e., those who are exempted from attending Hindi classes and those who have to undertake Hindi as a Language.
SECTION-3

3. TELECOM & NETWORK TECHNOLOGIES - I

(Duration: 17 weeks)

COURSE OBJECTIVES

The prime objective of the course is to expose the participants to the basics of Switching, Transmission, Mobile, and Data Communication technologies, along with insights on basic telecommunication and network infrastructure, to give a foundational background required for advanced training courses on telecommunications.

The course shall give an opportunity to the participants to have basic understanding of both switching and transmission technologies so that they may appreciate the overall telecommunication network.

COURSE CONTENTS

Outline of the course contents is given below:

3.1 SWITCHING MODULE (3 Weeks)

(i) PSTN SWITCHING MODULE (2 WEEKS)

- Speech Signal Processing & PCM principles
- PSTN: Overview and Architecture
- PSTN: Access Network, components and management
- Digital Switching Concepts
- Digital Signalling Concepts - CAS, CCS#7
- Traffic Theory and Traffic Engineering
- IN, ISDN Concepts, Services and Applications
- Supplementary Services in PSTN
- NMS & Billing System for PSTN
- National Numbering Plan, International Routing concepts
- Introduction to PSTN NT Switches - OCB and CDOT
- EWSD switch- Functional Architecture & Units
- Subscriber, Routing, Charging Management(local) in EWSD
- Junction Management in the POI scenario
- Traffic reports & analysis
- Maintenance philosophy of NT switches.
- Field visit to PSTN NT switch vendor / operator premises.

(ii) TELECOM INFRASTRUCTURE (1 WEEK)

- Power supply arrangements for Telecom Systems:
  - Power plant systems - Conventional and SMPS
  - Indoor / Outdoor Power plants in Wireless networks
  - Storage batteries and VRLA Battery
• UPS and Inverters

• Electrical installations:
  • General Introduction to electrical infrastructure in Telecom Exchange buildings (E/A, Lighting, Lifts, Electrical installations etc)
  • Air conditioning - requirements and different systems
  • Earthing Types and Methodologies and Lightning Protection
  • Fire detection and Fire-fighting, fire drill/demo
  • BEE Standards for Electrical Installations, Energy conservation and Energy auditing

• Green technologies
  • TRAI guidelines, Alternative energy sources etc.

• Civil Construction and Maintenance aspects in Telecom Buildings:
  • Telecom buildings- types of buildings- Norms
  • Civil infrastructure in Telephone Exchange buildings
  • Towers- GTT, RTT, RTP, Wall Mounted etc.
  • Smart buildings – concepts
  • Water conservation and water harvesting
  • Visit to a tower site

3.2 DATA COMMUNICATIONS (4 Weeks)

COURSE CONTENTS

• Basic concepts of Data Communication
• OSI Layer
• Physical Layer
• Modems in Data Circuits
• Error Detection and Correction Techniques
• Data Link Control (DLC)
• HDLC & LAP-B
• Packet Switching & Message Switching Concepts
• Frame relay
• ATM Technology
• TCP/IP Protocol Suite: An Overview
• TCP/UDP header Analysis
• IPv4 and IPv6 Addressing
• IPv4 and IPv6 Header analysis
• Introduction to LAN & internetworking devices
• WAN
• ARP & RARP along with header analysis
• Point to Point Protocol (PPP)
• Asynchronous PPP Analysis using Protocol Analyser
• IP Routing Principles (Static & Dynamic)
• Routing information Protocol (RIP)
• Open Shortest Path First (OSPF)
• Border Gateway Protocol (BGP)
• Elements of Internet Node (BSNL-NIB)
• NIB Server Features
• Router, RAS & LAN switch Architecture
• Internet services: HTTP/ PROXY
• Internet services: E-mail, SMTP & POP3
• Internet services: FTP/TFTP
• Internet services: DNS, DNS64, DNS6
• IP Multicasting: Layer 2 & 3 Protocols
• Access control list
• DHCP & DHCP6
• Wireless sensor network
• Broadband components
• ICMP, IGMP Protocols
• VLAN

3.3 NEXT GENERATION NETWORKS (1 week)

• NGN Overview and Architecture
• Convergence through NGN
• NGN Services
• NGN Protocols: SIP, Megaco/H.248, Sigtran, RTP/RTCP, H.323 etc.
• NGN Soft switch: ZTE, CDOT etc.
• Interconnect, operational and security issues in NGN
• Case study of NGN deployment like IP TAX project of BSNL etc.
• Migration to NGN - issues & techniques.

3.4 MOBILE COMMUNICATIONS (PART-1) (5 weeks)

GSM, CDMA and UMTS

Learning Objectives:
• Understand the Basics of Cellular Mobile Communications (CDMA, GSM & 3G)
• GSM, CDMA and 3G Architecture
• Signalling and call processing
• Description of MSC
• Operation & maintenance of various sub-systems
• Traffic and service measurements.
• Radio resource management.
• Configuration, operation & maintenance.
• Mobile Number Portability

Course outline:

GSM
• GSM/GPRS Network Architecture
• Circuit Switched Core Network of GSM: MSC, HLR, EIR etc.
• Packet Switched Core Network of GSM: SGSN, GGSN etc.
• Mobile Number Portability
• Radio Network of GSM: BSC, BTS, OMC-R etc.
• Planning, engineering, designing principles of GSM RF Network
• Antenna systems, In-building solution etc.
• Applications/ Value Added Services in GSM/ GPRS: IN, SMSC USSD, IN, LBS, LBA, MMSC, Instant Messaging, Presence Service, Push to Talk, CRBT, OTA, GSM PBX etc.
• Advancements in GSM Technology: Evolved EDGE, VAMOS, Abis over IP, disaster Recovery for HLR, IN,
• SIM: Comp-128, H/w, File structure, Applications, ME-SIM Interface, PKI related aspects,
• GSM Mobile end user devices: Components, H/w, S/w, CODEC, Encryption, Modem, MSC, UART, Battery etc.
• Lawful Interception in GSM Mobile networks
• Coverage testing for Roll out Obligation
• Drive Test tools, Planning tools, Post Processing tools
• Billing Support System: CDR generation & Collection nodes, CDR Processing & Analysis
• Operation Support System: Traffic report Analysis
• SACFA related issues: Measurement of BTS Power, Antenna Height measurement, Lat-Long measurement
• Infrastructure Sharing issues
• IMEI and related issues

Topics such as technology concepts, different channels/protocols, RF engineering/link budget/optimization, mobile forensic, numbering schemes, national roaming, international roaming, cloning, etc. with reference to GSM technologies will be covered as part of above topics.

**CDMA Technologies**

(CDMA family of technologies- CDMA2000 1x, CDMA 2000 EVDO etc.)

• CDMA Network Architecture
• Circuit Switched Core Network of CDMA: MSC, MSC, HLR etc.
• Packet Switched Core Network of CDMA: PDSN, Home Agent, Foreign Agent
• Radio Network of CDMA: BSC, BTS, Coverage, OMC-R
• Planning, engineering, designing principles of CDMA RF Network
• Applications/ Value Added Services in CDMA: SMSC, IN, LBS, LBA, MMSC, CRBT, PTT, OTAP
• CSIM: Security Algorithm, Applications, H/w etc.
• Evolution of CDMA: EVDO etc.
• Lawful Interception in CDMA Networks
• Mobile Number Portability
• Coverage testing for Roll out Obligation
• Drive Test tools, Planning tools, Post Processing tools

Topics such as technology concepts, different channels/protocols, RF engineering/link budget/optimization, numbering schemes, national roaming, etc.
international roaming, cloning, etc. with reference to CDMA technologies will be covered as part of above topics.

**UMTS**

- UMTS Network Architecture
- Circuit Switched Core Network of UMTS: MSC-S, Media Gateway, HSS, MSC-Server, IMS etc.
- Fixed Mobile Convergence
- Packet Switched Core Network of UMTS: 3G SGSN, GGSN
- Radio Network of UMTS- RAN, Node-B, RNC
- UMTS-HSPA, evolved HSPA, VoIP over HSPA
- RF Network planning, designing, engineering, optimization principles
- Applications/ Value Added Services in UMTS: Video Telephony, Video Streaming, Mobile to PSTN Multi-Media Call
- UMTS Security: Security algorithms, Authentication, Encryption, UICC, USAT, USIM, ISIM
- Lawful Interception in UMTS Networks
- Mobile Numbering Portability Process
- Coverage testing for Roll out Obligation
- Drive Test tools, Planning tools, Post Processing tools
- Billing Support System: CDR generation nodes, CDR Analysis
- Operation Support System: Traffic report Analysis

Topics such as technology concepts, different channels/protocols, RF engineering/link budget/optimization, numbering schemes, national roaming, international roaming, cloning, etc. with reference to UMTS technology will be covered as part of above topics.

### 3.5 TRANSMISSION (4 Weeks)

**COURSE OBJECTIVE**

The primary objective of the course is to train the OTs for planning, installation, operation & maintenance of different types of transmission systems being used in Indian networks.

**COURSE CONTENTS**

#### (i) OPTICAL COMMUNICATION (2 WEEKS)

- Introduction to Fibre Optics
- Types of Optical Fibre Cables & constructions
- OF Cable splicing theory and techniques
- Survey & Link Engineering
- OF Cable laying techniques & practices
- Testing and Measuring Instruments
- Concepts of PDH
- Introduction to SDH
• SDH multiplexing
• SDH Network Elements and Topologies
• Protection in SDH
• SDH Networks Management System
• SDH Measurements and Performance Parameters
• Synchronization and Timing Principles
• Synchronization of SDH Networks
• SDH over Radio
• Next-Generation SDH
• MSPP
• Overview of DWDM
• DWDM Components and EDFA
• DWDM System Engineering and Planning
• Optical Transport Network/All Optical Network
• Digital Cross-Connect (DXC)
• Fibre in Local loop, FTTH
• Passive Optical Networks- GPON, GEPON
• Free-Space Optics
• Submarine cable system

(ii) RADIO COMMUNICATION (1 WEEK)
• Overview of Microwave and microwave system configuration
• Microwave Antennas and wave-guides
• Site Selection criteria and guidelines
• Installation of Antenna& waveguides, Equipment Installation
• Link engineering and performance objectives
• Frequency plans of Digital Microwave systems.
• Digital Microwave measurements.
• IP-based Microwave systems
• Digital Modulation schemes
• 6 GHz, 7GHz, 13 GHz Systems
• Mini-links for BTS Sites
• PMRTS
• SACFA Clearance
• EMF Radiation: Theory and measurement aspects
• Measuring Instruments and Field Measurements
• SAR

(iii) SATELLITE COMMUNICATIONS (1 WEEK)

COURSE CONTENTS
• Overview of Satellite Communications.
• Equipment configuration of a Satellite Earth Station.
• Installation of Earth Station Antennas viz. 11 M antenna (Azimuth, Elevation, Mount), 7.5 M antenna (x-y mount) and 4.5 M antenna (x-y mount).
• High Power Amplifier and RF multiplexers.
• Principles of Low Noise Amplifier
• Principle of Echo Suppressor and Echo Cancellers.
• Up/Down converters and Modulator/ Demodulator
• Inter-Satellite Interference /Freq. coordination.
• NOCC and Earth station Mandatory Tests.
• Antenna Tracking and control equipment
• FDM-FM & MCPC/ IDR Link Engineering.
• Procedures of site selection of Satellite Earth Stations.
• Space segment, features of INSAT III Satellites.
• Meteorological services of INSAT.
• Earth Station Maintenance and Planning
• Time Division Multiple Access Techniques, Digital Speech Interpolation Techniques.
• Code Division Multiple Access Techniques and its application to Very Small Aperture Terminal (VSATs).
• Power Plant for Satellite Earth Station.
• Digital Satellite Phone
• GMPCS
SECTION-4

4. DoT FUNCTIONS (5 weeks)

4.1 TERM cell Functions (1 Week)

One of the key roles of Department of telecom is vigilance, monitoring and security functions of telecom network in India. This module details the functioning of TERM cell.

Vigilance Functions

- Inspection of premises of Telecom and Internet Service Providers
- To file FIR against culprits, pursue the cases, issue notices indicating violation of conditions of various Acts in force from time to time.
- Analysis of call/subscription/traffic data of various licensees.
- Technical arrangement for the lawful interception / monitoring of all communications passing through the licensee’s network.

Monitoring Functions

- Monitoring of network parameters.
- Checking of the compliance by the licensee in respect of the license conditions and any directions issued by the licensor in public interest.
- To ensure optimum call completion ratio of inter operator calls.
- Disaster Management: Taking over of network in the events of natural calamities or the other emergency situations.
- Grievance redressal mechanism for subscribers in respect of deficiency by various operators.
- Customer Document Verification with the objective to ascertain whether the mobile service operators are following the DoT guidelines for Customer verification before providing connections

Security Functions

- Technical interface between Security Agencies and Telecom Service Providers
- Service Testing of various Licensed Service Providers in the Licence area and checking roll-out obligation as per license condition.
- Registration of OSPs and Telemarketers in License Service Areas

4.2 Licensing Functions (1 Week)

In India, there are many types of Telecom services for which licenses are issued to interested applicants subject to fulfilment of rules, regulations & guidelines. As the licensor function, DoT is responsible to ensure maximum returns in terms of social benefits, bridge the digital divide and protect the interests of consumers. Licensing also needs to take care of business viability of licensees as well as issues of national security. This module explains the process of license drafting, approvals and grant to applicants. All existing licenses will be studied by the Officer Trainees as case studies.
• Concept of License, drafting and approval procedure
• Existing Licenses (PSTN, GSM, 3G, UASL, ISP, IP, PMRTS, NLD, ILD, OSP etc.)
• Policy and procedure for grant of licenses

4.3 Wireless Planning & Spectrum Management (1 Week)

Spectrum is a limited resource and its efficient use delivering maximum returns to society has to be ensured by WPC wing of DoT. Spectrum is also a source of revenue for the government. Transparency in awarding the spectrum to applicants is a key expectation of citizens in a democratic setup. For the smooth functioning of wireless systems, a robust system of frequency allocation avoiding interference is a must. Besides this, defence forces also need vast resources of spectrum. This module explains the spectrum usage in India for various telecom systems, licensing policy for spectrum and related regulatory and monitoring aspects. The contents of this course are outlined below:
• Frequency Spectrum Management
• Statutory functions of the Central Government and issues licenses to establish, maintain and operate wireless stations
• Licensing and Regulation
• Coordination and standardisation interface with ITU
• Standing Advisory Committee on Radio Frequency Allocation (SACFA)
• Wireless monitoring stations

4.4 USO Fund (1 week)

The USO Fund was established in 2002 with the fundamental objective of providing access to ‘basic’ telegraph services. Subsequently, an Act has been passed on December 29, 2006 as the Indian Telegraph (Amendment) Act 2006 to amend the Indian Telegraph Act, 1885 to enable provision of all types of telegraph services. The resources for implementation of USO are raised through a Universal Service Levy (USL) which has presently been fixed at 5% of the Adjusted Gross Revenue (AGR) of all Telecom Service Providers except the pure value added service providers like Internet, Voice Mail, E-Mail service providers etc. This module explains about the USO fund system, activities supported by USO fund, methodology for disbursement of funds etc.
• Background of USO fund: Need and international scenario
• USO Fund organisational setup
• Activities of USO (Streams) and achievements thereof
• USO subsidy model for Net Cost, Capital Recovery, Operating Expenses and Revenue
• Case studies on grant of USO subsidy
• Role of CCAs
• Visit to few USO funded sites

The module maybe conducted together for ITS and P&T Accounts and Finance Service Officer Trainees.
4.5 Telecom Engineering Centre (TEC) Functions (1 week)

Every country needs a mechanism for driving Telecom Standards, Manufacturing Support and Network Building Skill sets to serve its interests and market. With many service providers using different technologies of multiple vendors, interface standardisation and obsolescence issues have to be addressed. This module deliberates on the functions of Telecom Engineering Centre of DoT which has been entrusted to take care of all such issues. The module broadly covers:

- Organisational setup of TEC
- Preparation of Generic Requirements (GRs), Interface Requirements (IRs), Service Requirements (SRs), and Standards (SD)
- Drafting Study paper and White paper
- System for providing Technical advice to DoT
- Testing & certification of Telecom Equipment
- Validation testing of telecom equipment
- Concept of National Study Group (NWG)
- Functioning of ITU and ITU study groups
- Conformity Assessment Body (CAB)
- Mutual Recognition Assessment (MRA)
- Case studies
SECTION-5

5. REGULATION AND DISPUTE SETTLEMENT (1 week)

The Telecom Regulatory Authority of India (TRAI) was, established with effect from February 20, 1997 by an Act of Parliament, called the Telecom Regulatory Authority of India Act 1997, to regulate telecom services, inter-alia, in respect of fixation/revision of tariffs for telecom services which were earlier vested in the Central Government. TRAI's mission is to create and nurture conditions for growth of telecommunications in the country in a manner and at a pace which will enable India to play a leading role in emerging global information society. One of the main objectives of TRAI is to promote a level playing field which facilitates fair competition amongst all telecom service providers.

The TRAI Act was amended in January, 2000, where inter-alia, a Telecommunications Dispute Settlement and Appellate Tribunal (TDSAT) was established to take over the adjudicatory and dispute functions from TRAI. TDSAT was set up to adjudicate any dispute between a licensor and a licensee, between two or more service providers, between a service provider and a group of consumers, and to hear and dispose of appeals against any direction, decision or order of TRAI.

This module shall expose the Officer Trainees to the functioning and activities of TRAI and TDSAT, as outlined below:

- Organisational setup of TRAI
- Regulations
- Directions to Telecom service providers
- Tariff Orders
- Quality of Service Audit/Survey
- Performance Indicator reports
- Process of consultation
- Functioning of TDSAT
- TRAI and TDSAT case studies

SECTION-6

6. FIELD ATTACHMENT STAGE-1 (TERM CELLS) (8 weeks)

TERM Cells are one of the major field formations of DoT in the Telecom Circles. Under Stage-1 of the Field attachment, every OT will be attached to one of the TERM Cells, for a period of eight weeks. This attachment under Stage-1 will give a practical exposure to all the OTs regarding the working of TERM Cells. The second stage of Field Attachment (DOT Units) is described in Section-18.
SECTION-7

7. TELECOM & NETWORK TECHNOLOGIES - II

(Duration: 9 weeks)

COURSE OBJECTIVE: Objectives of this module is to impart understanding on advanced topics in telecom & network technologies, including advanced Mobile Technologies and Cyber security. This course shall also introduce the concepts and techniques of Lawful Interception and Monitoring in telecom and IP networks. The Officer Trainees shall gain practical skills required to prepare them for handling various job responsibilities in licensing, monitoring, coordination and security aspects of telecom and IP networks.

7.1 MOBILE COMMUNICATIONS (PART-2) (4 weeks)

WiFi and WiMAX Technologies

(IEEE standards based technologies such as 802.11b, 802.11g and 802.11n, WiMAX 802.16e and WiMAX 802.16m (4G) etc.)

- WiMAX Network Architecture with functions of each node
- Applications/ Services in WiMAX
- Wi-MAX Core Network 802.16e based
- Wi-MAX Radio Network 802.16e based
- Security Aspects in WiMAX networks
- Wi-MAX Core Network 802.16m based
- Wi-MAX Radio Network 802.16m based
- Wi-Fi IEEE 802.11 b,g
- Security Aspects in WiFi
- Wi-Fi Hotspot 2.0
- Coverage testing for Roll out Obligation

LTE & LTE Advanced Technologies

- LTE Network Architecture
- Core Network of LTE: SAE/ EPC, MME, Serving Gateway, PDN Gateway, PCRF, IMS etc.
- Radio Network of LTE,: E-UTRAN, eNodeB, Air Interface, Relays, Inter-RAT working etc.
- Self Organized Network
- Applications/ Services in LTE: VoIP, IP based conferencing, VPN, Emergency Call on IP, eMBMS
- LTE and Wireless Sensor Networks, SUN
- LTE-Advanced, Developments in Release 11 & 12 of 3GPP
- End-User Devices in Wireless Networks: Mobile Handset, Dongle, OS, Applications
- Lawful Interception in Mobile Networks
- Future Networks, SDN, Network Function Virtualization
• Coverage testing for Roll out Obligation
• Drive Test tools, Planning tools, Post Processing tools
• Infrastructure Sharing issues

Topics such as technology concepts, different channels/protocols, RF engineering/link budget/optimization, numbering schemes, national roaming, international roaming etc. with reference to LTE technology will be covered as part of above topics.

**Emerging Wireless Technologies & Applications**

• HAPS
• SRDs
• Cognitive radios
• ZigBee
• Emergency services and Mobile Networks
• Disaster Management & Mobile Networks
• Voice, SMS Spam handling in Mobile Network
• Jammers
• Principles of inter-mobile technologies interference analysis – In-Band and Adjacent Bands
• Case studies of inter-mobile technologies interference analysis
• Principles of spectrum requirements forecasting
• Socio-economic Impact of Mobile services
• Linkages of Mobile Technologies, applications/ services with inclusive growth
• TRAI recommendations related to Mobile technologies/ services
• Emerging issues related to Mobile technologies/ services with respect to Licenses.

**7.2 LAWFUL INTERCEPTION AND MONITORING (1 WEEK)**

Objective of this module is to impart in-depth knowledge about rules, policies and technological aspects of lawful interception & monitoring which are of concern in the context of national security.

• Licensing provisions
• TEC GRs on LIM & LIS for mobile, Fixed, ISP, IPLC, ILD
• Centralized Monitoring System
• Concept of LEAs and coordination mechanism
• Visit to LIM/LIS installation
• Introduction to Deep Packet Inspection technologies
• Various types of mobile handsets and features

**7.3 STRUCTURE OF NETWORKS, INTERCONNECTION & SERVICE PROVISIONING (1 WEEK)**
In this module, the Officer Trainee shall get to understand the Indian Telecom network structure at the macro-level, and the interconnection rules and inter-operator billing systems. The Officer Trainees shall also get an overview of the functioning of a Telecom Service Provider (TSP), including the service provisioning aspects:

- PSTN and Mobile Networks
- NLD and ILD networks
- Typical access network traffic aggregation methods across copper/fibre/wireless networks
- Leased Circuits and SLAs
- NIXI
- IRINN and APNIC
- Peering/Interconnection of ISPs
- Pol provisioning & Interconnect billing
- Revenue Assurance
- Commercial conditions of retail service
- Customer care system, Call-Centre network

7.4 CYBER SECURITY (3 Weeks)

- Network Security/ Cyber Security/ Computer security and its attributes
- Encryption
- OS and security
- Application security, SQL Injection & Cross Scripting
- INTRUDER
- IDS & IPS
- Phishing and Identity Theft
- Virus, Worm, Malware, BOTNET and recent vulnerabilities
- Cyber space and different kinds of vulnerabilities
- Cyber crime: Mobile & Wireless Security
- Cyber crime & Cloud Computing
- Tools & methods used in cyber crime: Keyloggers
- Role of ITU, DoT and CERT-IN
- TCP Finite State Machine (FSM): States, Events and Transitions
SECTION - 8

8. This week shall consist of two modules:

**DISASTER MANAGEMENT**  (Duration: 3 days)

- Types of Disasters
- Fundamentals of Disaster Management
- Role of Communication Technologies
- DM framework in India
- Role of DoT
- Case Studies

**ETHICS IN PUBLIC ADMINISTRATION**  (Duration: 2 days)

- Basic ethical principles
- Values for administration
- Integrity
- Case study

SECTION - 9

9. **Study visit to Major Telecom Installations, Telecom Industries and TERM Cells**

**DURATION: 2 WEEKS**

**COURSE OBJECTIVES:**
Under this module the Officer Trainees will be visiting major Telecom installations and Telecom industries of the country like ITIs, Telecom Equipment Manufacturers, Telecom Centres of Excellence (TCOEs), TSP/OSP installations and Network Operation and Control Centres, including those of private operators, and TERM cell offices etc., where they would familiarise themselves with the working of these units and gain useful practical exposure through site visits and interactions. These visits shall give them a feel of various aspects and activities of Telecom sector.

SECTION-10

10. **NORTH-EAST STUDY VISIT (1 Week)**

The communication facilities in many parts of the North Eastern Region of India are not satisfactory due to the difficult terrain and other challenging conditions related to installation of telecom networks and their operation & maintenance.

As a study tour, the Officer Trainees will be given an opportunity to visit and explore the telecom services in these areas. The trainees shall do a survey of the status of telecom facilities in some of the urban and rural areas of the North-Eastern states. They shall
meet and take feedback from different strata of telecom users and organisations in the region and understand their requirements. This shall also help them in having a better understanding of the region and its people.

After completion of their field visit, the Officer Trainees shall submit a visit report and deliver a presentation on their study at NTIPRIT. The report shall enumerate the suggestions for the improvement of telecom facilities in the region. The report of the OTs shall be evaluated at NTIPRIT based on the work done during the study and suggestions given.

SECTION-11

11. PROJECT WORK SUBMISSION AND PRESENTATION (1 week)

Project work will be assigned to the Officer Trainees by the various divisions of NTIPRIT to enable them to do in-depth exploration of various topics related to telecom and to bring out their creativity. Depending on the batch size of OTs, groups may be formed while assigning the project topics, or may be assigned individually to each OT.

The project topics will be assigned during the Telecom & Network Technologies -1 training modules, so that the Officer Trainees may start project study concurrently. A time duration of 1 week will be given, as per schedule decided by the Institute, for project report finalisation and submission, including the presentation on the project.

SECTION-12

12. HINDI (RAJBHASA) (1 week)

This module will cover the Hindi policy of Government of India, important Hindi terms used in office working and practical on drafting Hindi correspondence.

SECTION-13

13. ATTACHMENT TO DoT H/Q AND TEC (5 Weeks)

The Officer Trainees shall be attached for 5 weeks by rotation to the various divisions/wings of DoT Headquarters at New Delhi and to Telecom Engineering Centre (TEC) as outlined below, for a structured first-hand exposure of various activities of these divisions under the guidance of officers working there.

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<tr>
<th>Sl. No</th>
<th>Attachment with</th>
<th>No. of Weeks</th>
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<td>1.</td>
<td>AS division, DoT</td>
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<td>CS division, DoT</td>
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<td>PG Cell, DoT</td>
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<td>DS division, DoT</td>
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<td>Sl. No</td>
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<td>5.</td>
<td>TERM HQ, DoT</td>
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<td>SU division, DoT</td>
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<td>7.</td>
<td>Security Wing, DoT</td>
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<td>NT division, DoT</td>
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<td>9.</td>
<td>Public Investment Promotion (PIP) Division, DoT</td>
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<td>Establishment division</td>
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<td>12.</td>
<td>Finance &amp; Accounts wing, DoT</td>
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<td>13.</td>
<td>International Relations (IR) Division, DoT</td>
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<td>14.</td>
<td>TEC NR division</td>
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<td>15.</td>
<td>Any one Core division of TEC</td>
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<td>TOTAL</td>
<td>5 Weeks</td>
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SECTION-14

14. ATTACHMENT TO TRAI (1 week)

The Telecom Regulatory Authority of India has been playing a very important role in the Indian Telecom scenario with its crucial Regulatory and Recommender functions. TRAI's mission is to create and nurture conditions for growth of telecommunications in the country in a manner and at a pace which will enable India to play a leading role in emerging global information society.

The Officer Trainees shall be attached to TRAI Headquarters at New Delhi for a week to get exposure to the working of the various functional divisions of TRAI and their activities.

SECTION-15

15. ATTACHMENT TO C-DOT AND BBNL (1 week)

The Officer Trainees shall also be attached for a total of one week to C-DoT, the R&D unit of DoT and Bharat Broadband Nigam Ltd. (BBNL), the SPV setup by the Govt for the establishment, management and operation of the National Optical Fibre Network (for 3 days and 2 days respectively at their Head Offices in New Delhi), to help Officer Trainees understand the functioning of both units of DoT.

SECTION-16

16. Joining time before Field Attachment
Subsequent to the previous module, a **Joining time of 1 week** shall be given to the Officer Trainees before between relieving from NTIPRIT and joining at the respective Field Attachment stations. Field attachment will be conducted as described in Section-17 and Section-18. This joining time will be given only once, i.e. before joining at Field Attachment station. Further, as per the existing rules, only the direct journey via the shortest route between NTIPRIT and Field Attachment station shall be reckoned for the purpose of travel expenses.

**SECTION-17**

17. **FIELD ATTACHMENT TO BSNL/ MTNL** (8 weeks)

Under the Field attachment of 8 weekswith BSNL/MTNL, each Officer Trainee shall be attached to one of the territorial circles of BSNL, or to MTNL- Delhi/Mumbai, where they shall undergo field exposure to Network planning and O&M activities of the cellular mobile (GSM & CDMA) network, and data network including the respective billing centres, TAXs etc., under the guidance of the officers working there.

**SECTION-18**

18. **FIELD ATTACHMENT STAGE-2 (DOT UNITS)(21 weeks)**

**OBJECTIVE:** The objective of second stage of Field attachment to DoT Units is to enable the Officer Trainees to take responsibility while working in a particular unit of DoT as attached officers. This would help the Officer Trainees gain deeper and contextual appreciation of the theoretical inputs that are given to them during the institutional training. This will also give a greater comfort level and confidence to the Officer Trainees in handling the charge of the working posts independently.

During this attachment period, each Officer Trainee shall be posted at one of the divisions/cells of DoT HQ/TEC or at one of the TERM Cells to get an in-depth understanding of the concerned division/cell by working as a part of the same. The Officer Trainee will discharge all duties assigned to him/her during this period by the controlling officer in the division/cell.

**SECTION-19**

19. **VALEDICTORY AND PROFESSIONAL EXAM** (2 weeks)

Towards the end of the Training Programme the Officer Trainees shall return to NTIPRIT from their Field attachment for a period of two weeks, for a Valedictory Module. Under this module, emphasis will be laid on experience sharing by the Officer Trainees out of the exposure gained from the various attachments.

The Professional exam of the Officer Trainees shall also be conducted during this period.
GENERAL INSTRUCTIONS FOR ITSOFFICER TRAINEES

A. EXPECTATIONS FROM OFFICER TRAINEES- CODE OF CONDUCT

1. Etiquette and Behaviour(Shishtachar): Good manners and etiquette lend confidence and charm to an officer's personality. The Officer Trainees are expected to maintain the highest standards of behaviour and decorum, befitting an officer - both inside and outside the Institute. It is expected of the Officer Trainees to be courteous, polite and well-mannered towards each other, with faculty and with the institute and hostel staff. The same standard of behaviour and decorum is expected from the Officer Trainees when they go to other institutions/Offices for training or visits. Officer Trainees must ensure that their behaviour and conduct towards Officer Trainees of opposite sex is beyond reproach. The Officer Trainees are advised to go through the Shishtachar booklet (enclosed as Appendix), which contains exhaustive guidelines on etiquette, protocol and manners during official and semi-official occasions, compiled for guidance and ready reference of the Officer Trainees.

2. Punctuality: Punctuality on each occasion is a sine-qua-non for discipline. It is expected that the Officer Trainees will reach the venue of any scheduled event, at the classroom or otherwise, five minutes ahead of time and will be seated in their allotted place-position at least five minutes before the event. This is the first expectation from Officer Trainees and they should ensure that there will not be any occasion to remind it during the course.

3. Conduct: All officers in Govt. service are bound by a code of conduct and norms of behaviour. The Officer Trainees are advised to familiarise themselves of the CCS (Conduct) Rules, 1964 at the earliest and follow the code of conduct and the norms of behaviour in letter and spirit.

4. Attire: The Officer Trainees are expected to be appropriately attired for every occasion. The details about what constitutes proper attire are given in the Shishtachar booklet (enclosed as Appendix). The Officer Trainees are advised to follow the appropriate norms of attire in the Institute as well as Hostels. Inappropriate or shabby attire during classroom sessionshall be viewed seriously.

5. Participation: It is expected that the Officer Trainees participate fully in all the activities that make-up the Training Programme. The Officer Trainees shall demonstrate their youthful and praiseworthy creativity in all their endeavours. During participation in classroom discussions, the Officer Trainees are expected to be polite and considerate to all others present.

6. Maturity: Above all the Officer Trainees are expected to behave like mature individuals. Mature persons have a balanced frame of mind at all times be it their workplace or personal space. They prove to be an asset to any organisation.

B. INSTRUCTIONS

1. Use of mobile phones/tablets etc. during classroom sessions is strictly prohibited.
2. Officer Trainees are expected to take their own notes in the classes. Some supplementary/ background reading materials may be circulated for some of the lectures.

3. Questions may be asked to clarify doubts. However, in case of difference of opinion, lengthy argument with the speaker is to be avoided. On such occasions, the point may be separately discussed with the speaker after the class.

4. The Officer Trainees shall ensure that there is no noisy behaviour during the assembly or dispersal of classroom sessions, or during tea-breaks. No disturbance or inconvenience should be caused to other offices or classrooms in the institute.

5. **Participation in extra-curricular activities and organisation of events:**
   
   a. It is mandatory for all Officer Trainees to regularly participate in Jogging at the scheduled time and place.

   b. In addition, they are also required to participate either in PT or Yoga in the morning at the scheduled time. All these activities will be conducted under the supervision of instructors.

   c. For Jogging/PT/Yoga, proper clothing needs to be arranged by the Officer Trainees. The male Officer Trainees should wear white T-shirt with white track pants/shorts, or a white tracksuit and white canvas/sports shoes with socks. Female Officer Trainees should wear white salwar-kurta, or white T-shirt with white track pants, or a white tracksuit and white canvas/sports shoes with socks.

   d. In addition to PT, Yoga and Jogging, the Officer Trainees are required to take part in other games like Tennis, Table Tennis, Badminton, Carom, Cricket, Basketball etc., for which facilities exist in the Campus. Instructors/coaches will be available for the sports activities.

   e. Sports Tournaments: The Officer Trainees shall be required to organise tournaments of sports like Cricket, Badminton, Table Tennis, Carom tournaments etc. and Athletic events, with participation by all Officer Trainees in individual or team events.

   f. Cultural Programmes: The Officer Trainees shall be required to organise Cultural Programmes consisting of solo and group performances, skits, plays etc., ensuring participation by all Officer Trainees in the programmes.

   g. The participation in all these activities and events shall form part of the assessment and evaluation.

6. **Leave**

   a. **No leave will normally be granted during the courses, except in the most compelling circumstances.**

   b. In case leave is granted, then before proceeding on leave the written approval of the ADG in-charge must be obtained. Any absence without permission would be treated as ‘unauthorised absence from duty’ and will be dealt with as per disciplinary rules.
c. Wilful absence from duty after expiry of sanctioned leave period renders a Govt. servant liable for disciplinary action. If any Officer Trainee overstays beyond the sanctioned period of leave, the entire period of absence will be treated as unauthorised and probation period may also be extended.

d. If an Officer Trainee is unable to attend the course on medical grounds, he/she shall obtain a certificate from the Medical Officer from a Government Hospital and only thereafter he/she shall apply for leave.

e. Officer Trainees who are granted leave shall take specific permission for leaving the station. Even during weekends and holidays, station leave permission shall invariably be obtained from the ADG in-charge, duly furnishing their leave address and contact number. Station leave permission during weekends can be denied by the ADG in-charge, in case assignments or self study topics are given to the OTs during a training module.

C. ASSESSMENT AND EVALUATION

The Institute has a well-laid out methodology for assessment and evaluation of the Officer Trainees during the probation period. The approach of the Institute in this regard is elaborated below:

i. The evaluation and assessment of the Officer Trainees should be exhaustive,

ii. Each individual training module will have tests, for which the Officer Trainees will be awarded marks. It would be necessary for every OT to pass these tests as per the qualifying criteria of 60% marks. The qualifying criteria has been elaborated in para-h.

The following methodology will be adopted for assessment & evaluation of the Officer Trainees:

a. Each individual classroom training module will have a written test or a lab-based test for 40 marks per week, e.g. a two-weeks duration training module may have one or more than one test of total 80 marks.

b. The fifteen weeks Foundation Course conducted at designated institute will also have an overall evaluation of 600 marks, which shall be included as such in the overall marks.

c. The North-East Study visit shall be of 40 marks.

d. The Project work shall be of 80 marks.

e. The Field Attachment Stage-2 (DoT Units) of 21 weeks duration shall be assigned 100 marks and it shall be based on the performance of the Officer Trainee during Field Attachment as assessed by the respective controlling officer i.e. the concerned Head of division or unit. The controlling officer shall provide the assessed marks to NTIPRIT.

f. Assessment by Head of Institute: During the Training Programme, the Officer Trainees shall also be assessed on a continuous basis, based on their participation & performance in group-activities, presentations, sports & cultural activities and general behaviour, attendance, punctuality, discipline & personal
conduct. This assessment shall be out of total 100 marks, which will be awarded by the Head of NTIPRIT.

g. **Total marks at NTIPRIT**: The overall marking on the basis of Paras- a to f will constitute a total of 2400 marks, as given in Table-1:

<table>
<thead>
<tr>
<th>Assessment Heads</th>
<th>Total duration (in weeks)</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Administration &amp; Establishment (Orientation Programme not included)</td>
<td>3</td>
<td>120</td>
</tr>
<tr>
<td>Telecom &amp; Network Technologies-I</td>
<td>17</td>
<td>680</td>
</tr>
<tr>
<td>Telecom &amp; Network Technologies-II</td>
<td>9</td>
<td>360</td>
</tr>
<tr>
<td>Disaster Management &amp; Ethics in Public Administration</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>DoT Functions</td>
<td>5</td>
<td>200</td>
</tr>
<tr>
<td>Regulation &amp; Dispute Settlement</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>North-East study visit</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>Hindi (Raj Bhasha)</td>
<td>1</td>
<td>40</td>
</tr>
<tr>
<td>Project work</td>
<td></td>
<td>80</td>
</tr>
<tr>
<td>Foundation Course (FC)</td>
<td></td>
<td>600</td>
</tr>
<tr>
<td>Field Attachment Stage-2 (DoT Units)</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td>Assessment by Head of Institute</td>
<td></td>
<td>100</td>
</tr>
<tr>
<td><strong>Total Marks</strong></td>
<td></td>
<td><strong>2400</strong></td>
</tr>
</tbody>
</table>

Table-1: Constitution of Total marks at NTIPRIT

h. **Qualifying Criteria:**

i. It will be necessary for every Officer Trainee to secure at least 60% marks in each test to successfully complete the concerned module. In case the OT fails to secure 60% marks in any test, or fails to appear in the test, he/she will be given an opportunity to appear in a re-test. The OT shall have to qualify the re-test (with 60% marks) and this will be treated as a second attempt/ supplementary test, but he/she will be awarded the qualifying marks (60%) only, for the purpose of arriving at the total marks obtained during probation period. If the OT fails to qualify in the re-test also, then he/she will have to repeat the concerned module, and his/her probation period will be extended to that extent. However, for the Foundation Course (FC) conducted at any other Institute, the qualifying criteria would be as decided by the Institute conducting the same.

ii. The qualifying criteria of securing at least 60% marks shall also be applicable to the marks obtained in other training modules which do not include tests, including Field Attachment Stage-2 (DoT Units), NE Study visit, Project work, Assessment by Head of Institute etc. as listed in Para-g above. In case the OT fails to qualify in any of the aforesaid modules, the probation period shall be extended, as decided by the Competent Authority.
iii. **Attendance:** Every OT will have to maintain a minimum attendance of 60% in each course/module during the training programme. This attendance criterion shall also be applicable in those cases where he/she has been sanctioned any leave, including any leave sanctioned on medical grounds. If the attendance of any OT falls short of this criterion, he/she may not be permitted to appear in the tests, and he/she may have to repeat the concerned module. In such a case, his/her probation period will be extended by the duration of the repeated modules. No request for relaxation of this criterion will be entertained.

D. **ASSESSMENT BY OFFICER TRAINEES**

An evaluation questionnaire will be given to the Officer Trainees at the end of the individual courses to obtain their comments about the various aspect of the course. Informal discussions will also be held with the Officer Trainees during the course to obtain feedback from them. Feedback given by the Officer Trainees will be used for improving future courses. Feedback can be useful only if it is made objectively. All comments made by Officer Trainees must be polite.

E. **STAY IN THE HOSTEL**

Stay in the campus is compulsory for the Officer Trainees. Permission to stay outside will be accorded only under the most compelling circumstances. Families and guests are not allowed to stay in the hostels. No visitors will be allowed after 10 P.M.

Officer Trainees are expected to return to the hostel before 10 P.M. The hostel warden should be informed in advance if an Officer Trainee intends to come later than 10 P.M.

The hostel has fully equipped mess and hostel mess is compulsory. A mess committee may be appointed to supervise and suggest the improvement in the arrangements of mess.

No intoxicating drinks and drugs are allowed in the hostel. Action will be taken under Conduct Rules if any OT is found consuming liquor or in an inebriated state.

Cultural Programs are arranged in the C. K. Reddi Hall. Special Programs are arranged on National Festivals. Attending the Flag Hoisting Ceremonies on National Festivals is compulsory for all Officer Trainees.