



वार्षिक रिपोर्ट | Annual Report

November 24, 2022



Indian Railways Institute of Signal Engineering &
Telecommunications
Secunderabad

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Part I

○ Training Courses

The Institute has conducted 189 training courses during the period from November, 2021 to October, 2022 training 5919 personnel with 1,14,750 trainee days. The Institute has so far trained 1,03,650 trainees since its inception. The training courses conducted are furnished below :

Initial Courses for Supervisors - The Initial courses for Supervisor trainees were conducted in hybrid mode in Phase-I and Phase - II.

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	Initial Courses for App.JE/SSE (Signal)	10	712
2.	Initial Courses for App. JE/SSE (Telecom)	09	440
3.	Initial Courses for App. JE/SSE (Design)	04	173
4.	Initial Courses for Promoted JE/Signal	02	128
5.	Initial Courses for Promoted JE/Telecom	02	48
	Total	27	1501

Initial Courses for Probationers - The Centralised Probationary training programme of 50 IRSSE Probationers of 2019 and 2018 ESE (EOL) batch was completed during the year. The training programme of 2019 ESE (EOL) batch probationer also commenced. In addition to this, Appreciation courses were conducted for Probationers of other Services.

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	Initial Course for IRSSE (P) Phase I	01	01
2.	Initial Course for IRSSE (P) Phase II	01	01
3.	Appreciation Course for Other Service Probationers	02	86
	Total	04	88

- The Specialized Management training of 47 IRSSE probationers of 2019/2018 (EOL) batch was conducted by IIM/ Kozhikode from 14.02.2022 to 11.03.2022 in virtual mode.
- The Management training of 07 IRSSE probationers of 2019 (EOL) batch was conducted in National Rail and Transportation Institute (NRTI), Vadodara from 26.09.2022 to 21.10.2022.
- 50 IRSSE probationers have undergone two days training on Parliamentary procedures and processes on 14th and 15th March 2022.
- The posting examinations of 50 IRSSE probationers were completed during the period.

Integration Courses for Group B Officers - The Integration courses for Group B Officers who were promoted from Supervisor cadre are conducted in hybrid mode to give them exposure in Signalling and Telecommunications as a whole.

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	Integration Course for Group B Officers (Signal to Telecom)	06	123
2.	Integration Course for Group B Officers (Telecom to Signal)	02	31
	Total	08	154

Refresher Courses for Supervisors - The Refresher course for supervisors had the components of online portion for imparting training on theory of subjects and on-campus component for practical hands-on skills and evaluation.

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	Refresher Course for JE/SSE (Signal & Design)	13	748
2.	Refresher Course for JE/SSE (Telecom)	13	447
	Total	26	1195

Equipment Courses - The Institute had conducted Equipment courses on Modern Signalling and Telecommunication systems with focus on adoption of new technologies and achieving self-sufficiency.

A. Signalling

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	Automatic Train Protection Systems	02	26
3.	Kavach - Automatic Train Protection System	18	364
4.	Faculty Development Programme on Kavach	01	45
5.	Electronic Interlocking for Trainers	01	12
6.	Electronic Interlocking - Maintenance and Troubleshooting - Hitachi Rail STS make Microlok-II	02	32
7.	Electronic Interlocking - Maintenance and Troubleshooting on Medha make MEI-633	02	23
8.	Electronic Interlocking - Maintenance and Troubleshooting on Siemens make Westrace MK-II	02	31
9.	Electronic Interlocking - Maintenance and Troubleshooting on Kyosan make EI-K5BMC	02	32
10.	Hitachi Rail STS make Microlok-II EI Application Design and modification	02	39
11.	Application data & VDU data designing for Siemens make - Westrace MK-II EI	02	34
12.	EI - Application data & VD data designing for Medha make MEI - 633	02	36
13.	Digital Axle Counters - SSDAC and MSDAC	06	124
14.	Centralised Traffic Control / Train Management System	02	36
15.	Dataloggers	04	67
	Total	48	901

B. Telecommunications

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	IP MPLS	18	444
2.	LTE	12	302
3.	IP & NGN Exchanges	02	22
4.	Asterisk Based VoIP Exchange	04	48
5.	VSS, PS & Wi-Fi	04	89
6.	Network Security and Cyber Security	02	32
7.	IPv6	02	50
8.	SDH	01	22
9.	VoIP based Control Communication	02	51
	Total	47	1060

Capacity Building Courses - As per the directions of Railway Board, the Institute has laid emphasis on the conduct of courses for Capacity Building to equip the manpower with skills required for infrastructure creation.

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	Construction Practices	01	40
2.	Special Course on Signalling for Telecom Supervisors	02	45
3.	Special Course on Telecom for Signal Supervisors	01	12
	Total	04	97

Training Courses for PSUs - The Institute has conducted customized courses for the executives of PSUs generating revenues to the tune of Rs. 2,30,38,590/-.

S.No.	Name of the Course	No. of Courses	No. of Trainees
1.	Special Course on S&T for DFCCIL Executives	02	107
2.	Special Course on S&T for NTPC Executives	01	23
	Total	03	130

○ Focus on Kavach Training

Greater emphasis is laid on conduct of Equipment courses on Kavach, indigenous Automatic Train Protection System during the year. The Institute has roped in Equipment manufacturers, field experts and Research agencies to provide training to the personnel of Railways, PSUs and Private sector. Training courses have been conducted and 364 personnel (80 officers & 279 supervisors of Railways and 05 from Private Industry) have been trained. The training content includes visits to working installations and simulation experiments in the laboratory set-up in the Institute. A Two weeks introduction programme on Railway Signalling was also incorporated for the training course conducted in the month of January, 2022 to provide necessary prerequisite knowledge on Railway Signalling to the trainees from non-signalling background from Railways and Private Sector.

○ Formal Education on Kavach

The Ministry of Railways represented by IRISET signed a Memorandum of Understanding with AICTE on 13.01.2022 to introduce the subjects 'Railway Signal Engineering and Automatic Train protection – Kavach' as optional subjects for students of B.Tech and M.Tech in the engineering colleges. AICTE has approved the course curriculum for two courses designed by IRISET. IRISET signed Memorandum of Understanding with the following 05 Engineering Colleges for introduction of open elective and certification courses on Railway Signal Engineering and Automatic Train Protection System – Kavach for the students of B.Tech degree course as part of capacity building programmes.

01. National Institute of Technology, Warangal
02. C.V. Raman Global University, Bhubaneshwar
03. Vasavi College of Engineering, Hyderabad
04. Chaitanya Bharati Institute of Technology, Hyderabad
05. Geethanjali College of Engineering, Hyderabad

Based on the approval received from AICTE, a Faculty Development Programme of two weeks duration was organized from 05.09.2022 to 16.09.2022 through ATAL Portal for 41 teachers of Engineering colleges in blended mode.

IRISET has engaged with the Ministry of Skill Development and Entrepreneurship for partnering in Capacity Building for Technician and Supervisory Roles to meet the industry demand for execution of Kavach project. The curriculum developed by IRISET along with National Skill Development Corporation (NSDC) and Telecom Sector Skill Council (TSSC) for Technicians and Technical Supervisors for Automatic Train Protection System has been approved by National Council for Vocational Education and Training (NCVET). Industrial training and Faculty Development Programme on Kavach was organized for 32 EEE and ECE teachers of Government Polytechnic colleges of Telangana State at IRISET on 13.06.2022 in coordination with National Institute of Technical Teachers' Training and Research (NITTTR), Chennai, a premier HRD institute under the Ministry of Education, Government of India.

○ Activities of Centre of Excellence

As an innovative step towards Capacity Building, Center of Excellence (CoE) for Modern Signalling (Kavach) has been set up at IRISET during the year to provide expertise and technical inputs in the field of modern signaling through research, design and standardization, repository of best practices, support solutions and knowledge management. CoE is engaged in bringing improvements to braking logic to reduce chances of undue braking, overcoming poor radio communication network and implementation of strategies for improving the reliability of the system. The areas identified for development are migration to LTE for onboard Kavach communication, exploration of schemes for deployment of Kavach without stationary units and revision of technical specifications. The integration of EI with Kavach in the laboratory set-up is in progress. It is envisaged to develop state of art laboratories of brake interface units and track transponder units with modern and advanced instrumentation.

○ Revision of Curriculum

The Institute has conducted Zero based review of 09 (Nine) mandatory training courses (Initial, Refresher and Integration) by the committee of officers consisting of Senior Professors- Signal, Telecom & Training in the month of January, 2022. The important changes undertaken in the curriculum are - deletion of the outdated technologies, increasing the content of modern technologies, focus on the hand-on skills for maintenance and design and enhanced exposure on management skills.

○ Enriching Learning Resources

- The Institute drafted new technical notes for 25 Signalling subjects and 10 Telecom subjects as per the revised curriculum of Zero based review.
- The Institute also published a compendium on the take-aways for S&T personnel from the accident inquiry reports.
- The Institute created a common shared Digital Repository in the cloud . The contents placed in the cloud storage include technical notes, pdf presentations, classroom videos, laboratory demonstrations and webinar sessions. The classroom sessions of courses like Kavach, EI, IPMPLS, LTE, and IPv6 are also uploaded for the benefit of a large section of S&T manpower. The storage utilized for these resources is 275.3 GB.

○ Initiatives to improve Learning

- IRISET has become the first establishment on IR to successfully implement IPv6 as the backbone of networking with the development of a test lab setup to demonstrate the dual stack arrangement with IPv6 and IPv4. Websessions are conducted to guide Zonal Railways to implement IPv6 addressing scheme.
- In order to overcome the limitations in learning in virtual platform, a one hour exclusive doubt clearing session in each week is scheduled in the on-campus portion of hybrid courses.
- Greater emphasis is laid on real-time field failures and imparting necessary training to Apprentice JEs/SSEs to equip them with the skills to fix these problems and restore them. The signaling wing of the Institute has dedicated a week of the training programme for App. JE/SSEs (signal) towards the end of the course to simulate the conditions of failures collected from the sections by the trainees during their field training and impart them necessary inputs in the laboratory to handle such scenarios in their working post.

- Initiative is taken to allot topics for group discussion among trainees of Integration and Refresher courses to share good maintenance and construction practices.
- Wacom one graphic tablets are provided to all the faculty members to improve the quality of lectures in online mode.
- GNS3 simulator software has been installed in MPLS network configuration to provide hands-on training to the trainees of online courses.
- In the initial stages, demonstration setup consisting of IPMPLS switches and routers is set-up in the laboratories with the help of OEMs for appreciation of the working of the equipment by faculty and the trainees. As a permanent measure, IP-MPLS lab with 5 MPLS routers and 2 switches is established for imparting hands-on training on IP-MPLS technology being deployed on Indian Railways. 4 laboratory sheets on IPMPLS were introduced.
- A demo session is conducted on GPON Technology widely used in Wi-Fi installations on IR.
- Demonstrations on IPIS version 4 are made with the help of Vendors/OEMs for appreciation of Apprentice JE/Telecom trainees.
- Facilities for communication in ART for use during accidents are provided in the Transmission Systems Laboratory, as per the scale stipulated.
- Asterisk based VoIP Control Communication arrangement with auto configuration tool was set up in the Telephony laboratory.
- Demonstration on Fabio 4C (Time Division Multiplexer) equipment is conducted for the benefit of Apprentice JE/Tele trainees undergoing Initial Course. The applications of the equipment for BPAC connectivity and accident site communication are demonstrated.
- pfSense open source firewall application is loaded in Desktop PCs in the laboratory for hands-on training on network security.
- QR code was provided for MAC address updating in radius server for internet access to the trainees.
- Facility to issue online course completion certificates is implemented exploring the features on the ITMS portal.
- New online examinations module on Moodle platform with browser security features is implemented for conducting objective examinations of Refresher courses.

○ Capacity Building Exercise

Training programmes to build capacity of the organization to create and maintain the infrastructure were organized during the year.

- An exclusive online training programme for 12 trainers of Zonal S&T Schools was organized on Electronic Interlocking Systems.
- Exclusive courses on Construction Practices, Signalling for Telecom Engineers and Telecom for Signal Engineers were conducted.
- Inputs on Estimation, Preparation of Tender Schedules, Tender and Contract Management, Vigilance case studies and RAMS (Reliability, Availability, Maintainability and Safety) Standards were imparted to the trainees of all courses.
- 27 webinars were
- conducted on topics of general importance for management of works execution and modern Signalling and Telecom technologies. The topics of Webinar include - CRS sanction and Safety Aspects in S&T Projects, Intricacies in Estimation and Tendering for Kavach Projects, PPP and EPC contracts, Vigilance Perspective in Tenders and Contracts, Standardization of EPC documents and Special conditions for Automatic Block Signalling projects.
- Webinar on Cardiopulmonary Resuscitation (CPR) training was organized for 600 participants in consultation with iCARE Holy Family Hospital, Mumbai.

○ Assistance to National Rail and Transportation Institute (NRTI)

The Institute finalized the curriculum of two electives – Basic Signal Engineering and Automatic Train Protection System – Kavach for the students of Rail Infrastructure Engineering (RIE), Mechanical and Rail Engineering (MRE) and Rail Systems and Communication Engineering (RSCE) Streams of NRTI. The Institute has also made available the content of teaching for a two month long Certification course on ‘Railway Signalling and Train Protection Systems’ to be organized by National Rail and Transportation Institute (NRTI). The programme for 4-year B.Tech in Electronics and Communications Engineering stream with specialization in Railway Signalling and Communications is made available to NRTI.

○ Infrastructure Improvements

- Two elevators (one each in the Modern Signal and Telecommunications lab building and Ganga hostel), scooter parking, volleyball court (near Yamuna Hostel), vermi compost pit, sports annexe with facilities for indoor games and pathway for walkers in football ground are the infrastructure improvements carried out by the Institute.
- The works of renovation of Conference hall, commissioning of FAT set up for EI, Staff Canteen and Smart Class rooms with studio facilities are in advanced stage of completion.

○ Important Events

The important events conducted in the Institute during the year are furnished in chronological order below :

S.No.	Date	Event
1.	26.11.2021	Constitution day
2.	06.12.2021	Mahaparinirvan Diwas
3.	26.01.2022	73rd Republic Day ○ Cultural Programme
4.	08.03.2022	International Women's Day
5.	07.04.2022	IRSSE Probationers Passing Out Function ○ Release of Pratibimb ○ Cultural programme
6.	11.04.2022	Railway Week Celebrations ○ Cultural programme
7.	18.04.2022	131st birthday of Bharat Ratna Dr. B.R. Ambedkar.
8.	06.06.2022	World Environment Day ○ Massive Tree Plantation Drive
9.	17.06.2022	संसदीय राजभाषा समिति की दूसरी उप समिति की निरीक्षण बैठक

10.	21.06.2022	International Day of Yoga <ul style="list-style-type: none"> ○ Community Yoga practice session
11.	15.08.2022	76 th Independence Day <ul style="list-style-type: none"> ○ Distribution of National Flag as part of Har Ghar Tiranga initiative ○ Sports and cultural events ○ Collective Singing of National Anthem
12.	14.09.2022 to 20.09.2022	राजभाषा सप्ताह <ul style="list-style-type: none"> ○ तकनीकी संगोष्ठी
13.	15.09.2022	Engineers Day
14.	16.09.2022 to 30.09.2022	Swachhta Pakhwada <ul style="list-style-type: none"> ○ Swachhta Pledge ○ Drive against use of single-use plastic ○ Scrapping of unwanted material ○ Slogan & Essay writing competition ○ Shramdaan, Guest Lecture by Experts
15.	31.10.2022 to 04.11.2022	Vigilance Awareness Week
16.	31.10.2022	Rashtriya Ekta Diwas <ul style="list-style-type: none"> ○ Unity Run

Part II

○ **About**

- Indian Railways Institute of Signal Engineering and Telecommunications (IRISET) was established in 1957. The institute is the 4th established Centralised Training Institute among 8 Institutes in Indian Railways. Today, the institute is completing 65 years of its existence. The institute is a secured, eco-friendly, clean-and-green campus spreading over 28 hectares and is located centrally in the city and easily accessible from any part of the country.
- The institute is a premier technical inhouse training institute in Asia and has trained more than 1,03,650 personnel since its inception. The institute is one of the well equipped and has state-of-art classrooms of 516 seat capacity, 370 hostel beds and 5,000 sq mtr lab setups, 320 seat Indoor auditorium, 1000 seat Open Auditorium and indoor & outdoor sports facilities.

○ **Mission, Vision and Values**

मिशन विवरण * Mission Statement

Enhancing human and organizational excellence in Rail sector
by blending frontier technologies

विज्ञान विवरण * Vision Statement

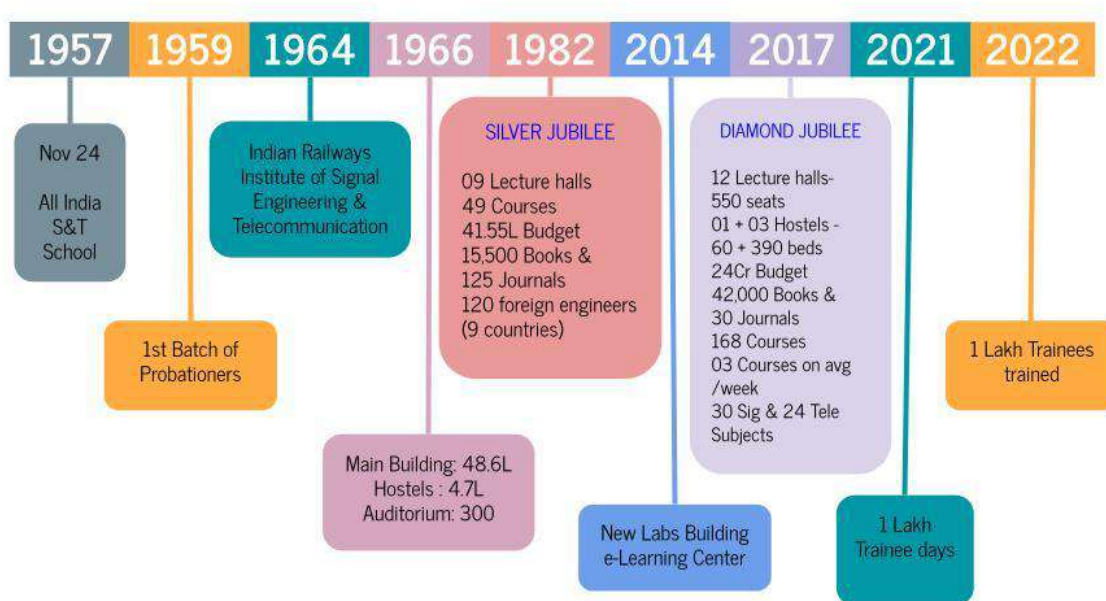
To make IRISET a Centre of Excellence (CoE) of global repute

महत्व * Values

Integrity, Safety, Leadership, Innovation, Synergy, Empathy and
Customer Focus

Safety, Security & Punctuality

○ Milestones



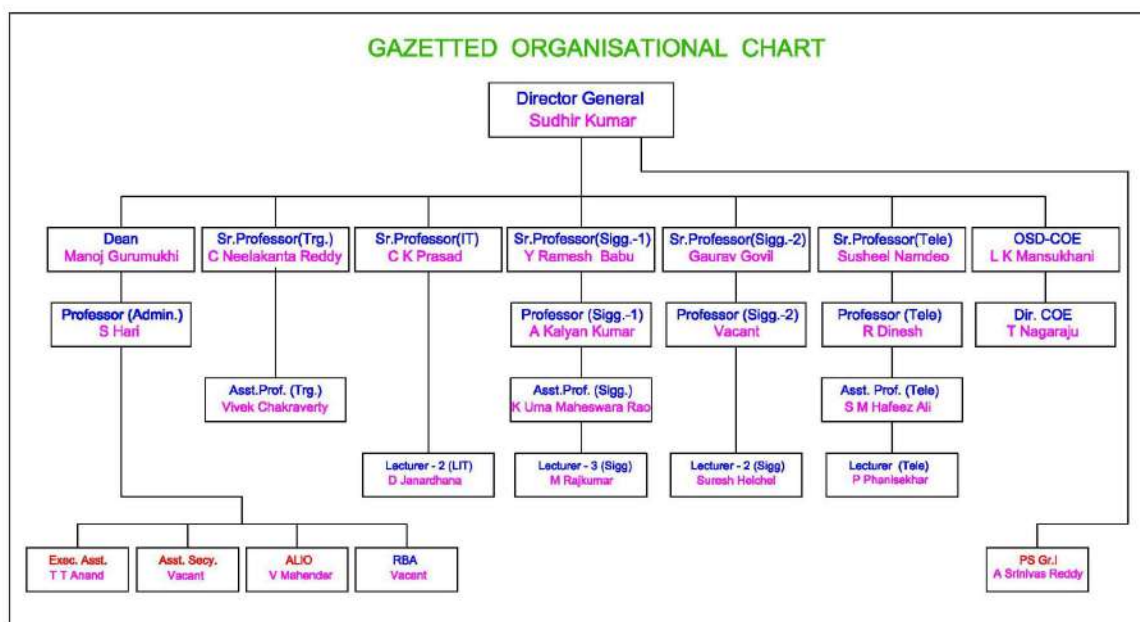
○ Role

- IRISET imparts training on Signal & Telecommunication subjects and certain general subjects of interest. IRISET has a mandate to conduct mandatory training courses - both Initial Courses (for Officers and Supervisors) and Refresher Courses (for Supervisors). IRISET conducts specially designed customer specific courses on modern technology systems. IRISET delivers training to executives of PSUs , Metros and private bodies.
- The clientele of IRISET is around 5000 plus in a year. IRISET has also trained 332 trainees from 19 foreign countries on Railway systems and Signal & Telecommunication technology.

○ Location

- The Institute is situated in Secunderabad, Telangana state. It is conveniently located in South Lalaguda, has road and metro train access, just 3 km away from Secunderabad Railway Station and about 42 Km from Hyderabad Airport. The campus is spread over an area of 28.3 hectares.

○ Organization



- IRISET is headed by a Director General (DG) belonging to Indian Railway Service of Signal Engineers. Dean of the institute looks after the administration, campus infrastructure and works. He is assisted by Professor Administration and his team consisting of Executive Assistant, Assistant Secretary, Assistant Library and Information Officer and Rajabhasha Adhikari. Signal, Telecom and Information Technology wings are headed by Senior Professors and they are in turn assisted by Professors, Assistant Professors, Lecturers and Instructors. Training wing, headed by Senior Professor and assisted by Assistant Professor, will schedule the courses and look after the training needs of the trainees. The Centre of Excellence is headed by an Officer on Special Duty and he is assisted by the Director.

- All faculty members possess rich experience in their field and have a flair for teaching. Training in laboratories is primarily managed by 35 instructors who are in various supervisory grades.

○ Infrastructure

○ Campus

- The institute is a secured, eco-friendly, and clean-and-green campus located centrally in the city and easily accessible from any part of the country.

○ Security

- Campus is secured 24x7 with security guards.
- An Integrated Security Camera System with 132 cameras has been provided on the campus to monitor open areas, administrative block, classrooms, laboratory, hostel and sports premises.

○ Wifi

- 27 Wifi access points have been provided in Administrative Block, Laboratories, all Hostels for seamless internet provision.

○ Classrooms

- There are 10 classrooms with a seating capacity of 516. The classrooms are provided with state of the art audio visual equipment and are air conditioned to provide a decent level of comfort to trainees.



- In conforming to covid-19 guidelines, two rooms are converted into classrooms duly equipped with required logistics.

- Two new class rooms with modern facilities are made ready to augment the training capacity.



○ Hostels

- There are four hostels, out of which one is for Officers and the remaining three for Supervisors with a capacity to accommodate 370 trainees. Recently renovation works have been carried out in all the hostels to provide a comfortable stay to the inmates. Day to day



housekeeping

activities in all the hostels have been outsourced. A separate mess is attached with each hostel, which is run on contract basis. Televisions, Gym, some indoor games like Table Tennis, Carroms, Chess etc. are available in each hostel. In addition, Billiards table and a state of art Gymnasium is available in

Officers Hostel. A new Supervisors hostel to accommodate 112 trainees is under construction.

○ Auditorium

- There is a well furnished centrally air-conditioned auditorium with a seating capacity of 320 , which is used for organising seminars, official functions and cultural programmes. The auditorium is named after Sri SA Srinivasan, founder principal of the institute.



- Openair Auditorium of 1000 seat capacity is located in the campus for conducting major functions and celebrations. Daily Yoga sessions are also conducted here.



○ Sports

- Institute has excellent facilities of Cricket, Badminton (two synthetic courts and one wooden floor court), Tennis (one synthetic and four clay courts), Volleyball, Basketball, Skating rink and Golf within the campus.



○ Library

- Institute's library with a seating capacity of 60 persons has a collection of about 30000 books on various subjects. A wide collection of Signalling and Telecommunication books are available. Library subscribes to 30 journals and periodicals of India and abroad. There is a large collection of Hindi literature books. Library is automated by providing the state - of - art library management system software (Libsoft). Online public access catalogue (OPAC) is available to search any type of documents in the library. All the books are barcoded to facilitate inventory management and issue/return of books. A scanner and photo Identity card-cum-library card printer are available.. Four PCs are provided for the use of trainees for browsing the internet and also for viewing audio visual CDs. The access for e-journals, e-magazines, e-books, e-manuals and NDL has been provided in ITMSI (RISET Training Management System).



intranet to access a large number of technical and research books.

- National Knowledge Network (NKN) with 100Mbps pipe is made available on campus

- **Laboratories**
- The Institute has well equipped laboratories for imparting hands-on training to the trainees on various subjects relevant to their jobs. A new laboratory building for capacity enhancement has come up in the year 2014 for housing new equipments on modern technologies.

- **Signalling Labs**

- **Outdoor Signalling Lab**

- This lab will give the exposure to the trainees on various outdoor signalling gears available in the field viz., Point machines (IRS-conventional & thickweb) , LC gates -MOLB & EOLB . Both RH and LH turn out layouts with point machines like IRS (conventional & thickweb), Track circuits for RE & Non RE , Signals with different types of route indicators and cascading arrangements and Mechanical signalling arrangements are available in this laboratory.



- **Train Detection Lab**

- This Laboratory is mainly equipped with different types of track detecting devices like Audio Frequency Track Circuit of ABB, Ansaldo UM71, Siemens FTGS and Alstom makes. The trainee will be able to study about the functionality of the systems, measure various parameters and troubleshoot minor failures created.



- **Digital Axle Counters Lab**

- This lab consists of different types of Single/Multi/Dual (High Availability) digital



axle counters of CEL, GGtronics, Medha, Eldyne makes. The trainee will be able to study the general architecture of the system, their functions and system power supply requirements. The trainees will be able to appreciate the advantages of Digital axle counters over conventional track circuits. Trainees will be able to know the advantage of HASSDAC over SSDAC in improving the reliability of the system.

○ Kavach - Train Protection and Warning System Lab

○ This lab consists of

- IRATP system : Kavach Equipments of HBL, Medha and Kernex makes
- TPWS systems of Ansaldo and Siemens makes

○ The trainee will be able to study the general architecture, various modes of operation and features of TPWS and Kavach systems.



○ The trainee will be able to differentiate the functionality between TPWS and Kavach systems. Testing of Kavach control tables can be demonstrated. The trainee will be able to simulate various field scenarios using a simulation panel.

○ Electrical Signalling Lab

○ The trainees will be exposed to different types of Electrical signalling Interlocking systems (British and Siemens).



○ The trainee will be able to study various features of panel operation. The trainees will be exposed to troubleshooting the failures created. The trainee will be able to study different types of relays and their purpose.

○ Electronic Interlocking Lab

- This lab consists of Electronic interlocking systems of different makes (Ansaldo, Medha, Siemens, Kyosan and



GE). The trainees will study about various EI system architectures (centralized or distributed), reliability features of the system and power supply arrangements of the systems. The lab consists of FAT setup model which enables them to test the signal control table. The trainee will be able to appreciate the compactness and reliability of these systems compared to conventional RRI's.

○ Power Supply Lab

- This lab consists of various types of IPS Systems. The trainee studies various parts of the IPS system, and their functions. He will be able to appreciate the ease of maintenance of these compact systems compared to bulky conventional systems. He will be able to access the load requirements of a station.



○ Block Signalling Lab

- This lab consists of various types of block instruments, IBS, UFSBI, bench model of the Automatic block working system. The trainee studies various types of single line and double line block instruments, their features, modification required to suit the RE area, functioning of various block circuits. The trainee studies about the concept of Intermediate block working and automatic block working and their circuitry. Trainees will be able to appreciate the line capacity enhancement using these systems.



- Telecom Labs
- Outdoor Telecom Lab

- This lab facilitates the trainees in study of construction details of various types of underground cables and indoor cables used for telecom applications and pair/quad identification. Facilities are available for measuring the electrical parameters of cables i.e. loop resistance, insulation resistance, transmission loss, psophometric noise, etc. The trainees are provided hands-on skills on



jointing methods of underground cable, fault localization and cable route tracing with specialized instruments. Study of Power supply arrangements, maintenance practices, battery chargers (self regulating and SMPS based), lead acid cells - Maintenance free and VRLA type, construction and maintenance practice of earthing arrangements are also part

of the laboratory experiments.

- Computer Lab

- The computer lab is well equipped for conducting online examinations for 50 trainees at a time using Moodle service which is Debian based open software developed in-house. It also provides support for all IT related assets hardware, Software and Networking. It also accommodates different servers and Railnet network of IRISET.



- Networking Lab



- This lab is aimed to train the trainees in concepts of TCP/IP networking by providing the real time environment. It is equipped with layer2 and layer3 switches, IP routers, SHDSL modems, statmuxes and terminal server. Training is imparted in establishing LAN and WAN, IP configuration of network devices.

- Facilities for training on Cyber security by using firewall NetAsq, Open source pfsense software and IP-MPLS through open source GNS3 simulator and Juniper Routers are recently made available in this laboratory.

- **Passenger Information System (PIS) lab**

- The Lab is equipped with IPIS rev 2.0 of RDSO/SPN/TC/61 and IPIS rev 4.0 Integrated Passenger Information system with complete model setup along with application software & hardware like Platform display boards, Coach guidance display boards & At a glance display boards, established with hot standby mode.



- Aimed to impart training to the trainees on Study of Passenger Information System, PIS Network Configuration and Troubleshooting of IPIS Network.

- **Telephony Lab**

- This lab is equipped with different types of circuit switching based Telephony Systems (ISDN-PBX) to impart training on hardware, software configuration and inter-exchange connectivity using PRI and E1 interfaces.
- This lab is also equipped with packet switching based IP-Telephony Systems (Open source Asterisk server based IP-PBX) to impart training on hardware, software configuration and inter-exchange connectivity using IP- Trunks, SIP trunks and PRI Gateways.
- Apart from these, training on IP-DSLAM equipment and its end point ADSL modem configuration for extending broadband to subscribers is imparted.



○ Train Traffic Control Lab

- This lab gives an opportunity to trainees to get acquainted with the actual system of Train Control Working with the help of various types of control communication equipment like Control Communication Equipment over Optical Fibre (CCEO) and Conventional Control Equipment available all over Indian Railways. In addition to these, the line communication which is available in two block stations, viz Emergency Communication, LC gate communication and Signal Post telephone working will be explained in detail with latest equipment.



○ Transmission Systems Lab

- The Transmission Systems Lab houses all the equipment needed for long distance communication. It offers training in programming of the systems and measuring various parameters, to establish and maintain a stable communication link. Trainees are exposed to sophisticated measuring instruments, like SDH Analyser ANT20 of JDSU make, PDH Analyser, OTDR, Fusion Splicing Machine etc.
- This lab imparts training on OFC, PDH and SDH equipment up to STM-4.
- This lab has facilities to impart hands-on training on GSM-R and ART equipment.



○ IRISET Club

- In addition to the academic activities and to have an overall development of trainees, a club has been formed in the Institute to promote various extra-curricular activities. The club provides a platform for interaction between the trainees and staff. The Club organizes various Sports and Cultural events. Tournaments in cricket, carroms, badminton, volleyball, Table tennis and chess are organized on a regular basis. During official functions, cultural programs are organized with active participation from trainees.



○ PT and Yoga Sessions

PT session is conducted in the morning for trainees of all initial training courses on all working days. Yoga session is conducted in the evenings to cover at least one day in a week for every batch as per the extant instructions of Railway Board.

○ Heritage Gallery

- A Heritage gallery having a collection of various Signalling and Telecommunication equipment depicting the evolution of Railway Signalling and Telecom was inaugurated in the year 2018 as part of the Diamond Jubilee Celebrations of the Institute.



○ General Information about Training Courses

- Railway Signal Engineering is not covered as a curriculum in any university, college or any other teaching institutions. The availability of literature on this subject is also limited. This puts IRISET in a unique position as the only institution imparting training on Railway Signal Engineering, not only in India, but also in larger parts of the world.
- The following courses are conducted for officers and supervisors on regular basis.

Category	Name of Training Course	Duration (weeks)
Gazetted Officers	Initial Course for IRSSE Probationers Phase-I	12
	Initial Course for IRSSE Probationers Phase-II	12
	Integration Course for Group B Officers (Sig to Tele) Phase I	03
	Integration Course for Group B Officers (Sig to Tele) Phase II	02
	Integration Course for Group B Officers (Tele to Sig) Phase I	04
	Integration Course for Group B Officers (Tele to Sig) Phase II	03
	Special Course for SAG Officers	06
	Appreciation Course for All other Services Probationers	01
	Equipment Course on Signalling & Telecom Systems including modern Technology subjects	1-3
Signal Supervisors	Initial Course for App.JE/SSE (Signal)	28
	Initial Course for Promoted JE(Signal)	17

	Initial course for App.JE/SSE(Design)	18
	Refresher Course for JE/SSE(Sig. & Design)	4
	Equipment Course on Signalling Systems including modern Technology subjects	1-3
Telecom Supervisors	Initial Course for App.JE/SSE (Telecom)	28
	Initial Course for Promoted JE(Telecom)	12
	Refresher Course for JE/SSE(Telecom)	4
	Equipment Course on Telecom Systems including modern Technology subjects	1-2
Executives & PSUs / Private bodies	As per the demands of the Organisation	-

○ Training Summary

○ Executive Summary of Productivity

Sn	YEAR		2017	2018	2019	2020	2021	2022 (Upto Oct-22)
1	Number of courses conducted / concluded	Gazetted	38	58	52	55	36	57
		Non-Gaz	79	106	85	91	99	101
		PSU	4	4	9	2	3	4
		Pvt.	0	0	0	0	0	1
		FN	0	0	0	0	0	0
Total			121	168	146	148	138	163
2	Number of Personnel trained	Gazetted	458	516	643	988	794	468
		Non-Gaz	2602	2758	2465	5480	5802	4331
		PSU	129	84	393	44	90	193
		Pvt.	0	0	0	0	0	45
		FN	0	0	0	0	0	0
Total			3189	3358	3501	6517	6686	5037
3	Earnings in Lakhs of ₹	PSU	50.53	80.65	732.44	109.84	140.05	227.24
		Pvt.	0	0	0	0	0	3.14
		FN	0	0	0	0	0	0
Total			50.53	80.65	732.44	109.84	140.05	230.38
4	Refresher Training imparted							
	Signal	Trainees	581	724	695	1341	800	602
		Courses	9	13	13	20	12	11
	Telecom	Trainees	360	457	374	813	491	400
		Courses	9	13	13	19	13	11
5	Special Course on Safety	Trainees	76	71	60	58	0	0
		Courses	5	4	3	2	0	0
6	Trainee Days		76315	73618	59739	82283	148314	91318

○ Works

- Details of Works Under Progress (PH-6500, SCR):

SN	PB No. (22-23) (Sanc Yr)	Name of the Work	Alloc	Sanctioned Cost (Cr.)	Status of work
1	741 (2016-17)	IRISET- Augmentation of Training Facilities.	RRSK, DF-III	4.62	Work in Progress TDC- Dec-22
2	743 (2017-18)	IRISET- Upgradation of basic amenities to Supervisors Hostel-1 & Hostel-3, B-block.	RRSK	3.88	Completed
3	744 (2017-18)	IRISET- Provision of KYOSAN EI system & strengthening of FAT setup for various Electronic Interlocking systems.	RRSK	3.61	Work in Progress TDC- Mar- 23
Sub-Total (PH-6500 PB)				12.11	

- Details of Works Under Progress (PH-6400, OSW-LSWP, SCR):

SN	PB No. (22-23) (Sanc Yr)	Name of the Work	Alloc	Sanc Cost (Cr.)	Status of work
1	742 (2015-16)	IRISET- Construction of Class Rooms on 2nd floor of newly constructed building opposite e-Learning Centre.	DF-III	1.92	Completed
Sub-Total (PH-6500, OSW-LSWP, SCR)				1.92	

○ Details of Umbrella Works Under Progress (PH-3300 S&T, SCR)

Sub-Umbrella work of South Central Railway - Provision of long term evolution based mobile train radio equipment at Golden Quadrilateral / Diagonal routes (1549 rkm) (Umbrella Work 2020-21) (PB 2021-22 of SCR, Item No:562)

SN	PB No. (22-23) (Sanc Yr)	Name of the Work	Alloc	Sanc Cost (Cr.)	Status of work
1	UI 591 (2022-23)	IRISET- Setting up of LTE Test bed, VoIP based Control Communication system Lab, PA System Lab, Up gradation of Audio and Video systems at IRISET, Improvements to Transmission Lab and Train Traffic Control Lab at IRISET	CAP	14.82	DE Sanctioned TDC Dec-23
Sub-Total of PH-3300 Itemized Umbrella Works/SCR				14.82	

○ Details of Umbrella Works Under Progress (PH-3300 S&T, SCR)

Work of South Central Railway - Provision of TCAS for WD-GTL-YA Section on Golden Quadrilateral/ Diagonal routes (372 Rkm)

SN	PB No. (22-23) (Sanc Yr)	Name of the Work	Alloc	Sanc Cost (Cr.)	Status of work
1	UI (2022-23)	Sub Work- Initial setup of COE-Kavach at IRISET	CAP	11.99	DE Sanctioned TDC Dec-23
Sub-Total of PH-3300/SCR				11.99	

○ Details of Umbrella Works Under Progress (PH-6500 Trg/HRD, NAIR)

Sub-Umbrella work of Western Railway- Augmentation of training facilities (for DG/NAIR for works of CTIs) (PB No. 1154/2018-19/NR)

SN	PB No. (22-23) (Sanc Yr)	Name of the Work	Alloc	Sanc Cost (Cr.)	Status of work
1	UI PB 769 (2018-19)	IRISET- Strengthening of Electronic Interlocking and FAT setup.	RRSK	11.79	Work in Progress TDC Dec-23
2	UI PB 769 (2018-19)	IRISET- Replacement of Supervisors Hostel No. 2.	RRSK	9.47	Work in Progress TDC Mar-23
Sub-Total of PH-6500 (Itemized Umbrella Works, CTIs)				21.26	

○ **Details of Works Under Progress (PH-6500 Trg/HRD)**

Sub-Umbrella work of Western Railway- Infrastructure upgradation of Training Institutes for integrated Skill Development of officials over Indian Railways (Phase-I) (for DG/NAIR for works of CTIs) (PB No. 1113/2019-20/NR):

SN	PB No. (22-23)	Name of the Work	Alloc	Sanc Cost (Cr.)	Status of work
1	UI PB 772 (2020-21)	IRISET– Upgradation to Administrative Building- Improvements to Corridors, Staircases, Doors, Windows, Wall Finishing, Railings and Roads.	DF-III	2.45	Work in Progress TDC Apr-23
2	UI PB 772 (2020-21)	IRISET- Provision of Video Conferencing system and VOIP Exchange at IRISET for training as well as administrative use.	DF-III	1.67	Work in Progress TDC Dec-23
3	UI PB 772 (2020-21)	IRISET- Upgradation to Hostel-4, Classrooms, Canteen, Suites in ‘C’ Block of Officers Hostel and Provision of Security Post in Hostels	DF-III	2.36	Work in Progress TDC Apr-23
4	UI PB 772 (2020-21)	IRISET- Provision of Air Conditioners in 28 Rooms of Officers Hostel Along With Strengthening Of Power Supply Arrangements And Provision Of Lifts.	DF-III	1.97	Work in Progress TDC Mar-23
5	UI PB 772 (2020-21)	IRISET-Development of Conference room, Installation of Video Surveillance System and Provision of webcasting at IRISET.	DF-III	2.49	Work in Progress TDC Mar-23
6	UI PB 772 (2020-21)	IRISET- Improvements for all the classrooms along with 2-Studio classrooms for e-classes.	DF-III	2.48	Work in Progress TDC Mar-23
7	UI PB 772 (2020-21)	IRISET- Providing OFC ring connectivity and improvements to LAN and Wi-Fi connectivity in Admin Building and Hostel 4.	DF-III	2.38	Work in Progress TDC Dec-23
8	UI PB 772 (2020-21)	IRISET– Improvement in Laboratories, Development of Multimedia content and Providing UPS for Admin Building and all Hostels.	DF-III	2.49	Work in Progress TDC Mar-23
Sub-Total of PH-6500 (Itemized Umbrella Works, CTIs)				18.29	