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Message from Director



In recent times, Artificial Intelligence (AI) has made remarkable inroads into various industries in India and other developing countries. It is also making entries into the field of Education in a more significant way in

developed countries. Artificial Intelligence is in the process of making a paradigm shift in the method of learning and teaching. It is expected that it will have an immense impact on the future of Education. The proponents of Artificial Intelligence (AI) advocate that personalized learning can be imparted to students easily by designing and developing customized curriculum based on individual needs and preferences. It will be very handy for the teacher to understand the learning needs of an individual student by considering his strengths, and weaknesses in terms of aptitude and attitude. Besides this, the progress of student's learning can be monitored and analyzed easily with corrective prescriptions for remedial measures. This AI technology

can help teachers in providing a requisite learning environment that can excite the student's imagination and trigger enthusiasm to unravel the inner potential lying dormant in his mind.

Armed with new AI technology, chatbots can be designed and developed that can answer students' questions. Based on previous academic performance and other requisite data, AI can predict student's performance which can help both students and teachers for taking course corrections for it. It can also provide predictive analytics that can arm both students and teachers to chart out a futuristic personal educational plan.

The AI technology can also provide immediate feedback directly to the students by identifying their mistakes and lacunas in teaching-learning process of course with suggestive remedial measures so that they can take corrective steps to improve their performance. The AI app is being designed and developed that can recommend specific but appropriate resources to students that can be helpful for augmenting their learning. It can also create better personalized educational content by using vast amounts of data. As the use of AI in the education system entails acquiring a sizable amount of data and its uses in various domains, it is likely to be misused and abused for multiple ulterior

purposes for making a mere profit. Besides this, the use of AI can burden parents and students with extra costs as the cost of AI tools and applications is quite exorbitant. Besides this, most teachers may not be familiar with this new AI technology and they may find it difficult to adopt this technology in their teaching process. Hence it is advisable to adopt the new emerging AI technology in education in a gradual manner after accessing all pros and cons with a proper understanding of its ramification as it may do detrimental damage to the education system. Let me end it with the following Indian thought;

हस श्वसिहि मंदं गच्छ च
Smile, breathe and go slowly

Prof. Debi Prasad Mishra
Director, NITTR, Kolkata

ARTICLE

Adoption of Industry 4.0 and 5.0 - Indian Perspective

Prof. Dipankar Bose, ME Department

1.0 Introduction:

What is surfaced in our mind when we first identify the term, "Industrial Revolution"? It specified major developments in the world of manufacturing and technology, straddling between 17th to 20th centuries. Since the first Industrial Revolution, successive developments have directed in manufacturing, from water and steam driven devices to electrical and digital electronic production, making manufacturing processes more manifold, automatic and sustainable so that machines can be operated with simplicity, efficiency and diligence.

The beginning of 21st century viewed the third Industrial Revolution or Industry 3.0 which saw the initiation and rise of Information Technology, internet, renewable energy as well as mobile and other linked devices. This phase witnessed remarkable innovations and altered the way modern world occupations as well.

Several years have conceded and now we stand on the tip of another two Industrial Revolutions. The fourth industrial revolution or Industry 4.0 has become datafication of virtually everything to create unlimited information bank. Countries across the world are all set to adopt it and India is also marching the path in its own means.

Furthermore, People nowadays need the human touch of mass personalization, so Industry 5.0 helps us to change from mass manufacturing to mass personalization/customization. Industry 5.0 is generating mass customization a certainty and, the fast feasts in manufacturing techniques, production system digitization and intelligence which are the needs of today's industrial sector. Table 1 signifies the progression of industrial revolutions.

Table 1. The progression of industrial revolutions [1]

Industrial Revolution	From	Shifted to	Time frame
Industry 1.0	Hand to Machine Production	Steam power	1750 -1850
Industry 2.0	Steam power	Electricity for mass production in industries	1850-1930
Industry 3.0	Electricity	Binary computer machines	1930 -2000
Industry 4.0	Binary computer to most advance computers	Datafication of virtually everything to create unlimited information	2000-2020
Industry 5.0	Datafication of virtually everything to create unlimited information	Maximizing human and technological strength	2020-onwards

2.0 Significant Features of Industry 4.0

The main themes of Industry 4.0 refer to technical assistance and incorporation of decentralized decisions signifying the following:

Technical support - the technological facility of systems to assist humans in decision-making and problem-solving, and the ability to help humans with difficult or unsafe tasks.

Distributed decisions-the ability of cyber physical systems to make decisions on their own and to perform their tasks as autonomously as possible. Both the above mentioned themes are operated through [2]

- Mobile Devices
- Internet of things (IoT) platforms
- Location detection technologies (electronic identification)
- Advanced human-machine interfaces
- Authentication and fraud detection

- Smart sensors
- Big analytics and advanced processes
- Multilevel customer interaction and customer profiling
- Augmented reality /Virtual Reality
- On-demand availability of computer system resources
- Data visualization and triggered "live" training

2.2 Indian adaptation of Industry 4.0

Study suggests that Indian adoption of Industry 4.0 is still beginning stage. However the following sectors have witnessed some applications. They are [3]:

2.2.1: Fast Moving Consumer Goods (FMCG) Sector –

The Indian FMCG (Fast Moving Consumer Goods) sector has started positioning Cobot or Collaborative Robots in their manufacturing/production process.

Cobots (industrial robots) require minimal supervision when they work alongside workers in a factory. Optimum utilisation of capacity and reduction of lead time can be accomplished if factories with weaker infrastructure and limited workforce undertake the help of Cobots become efficiently productive.

2.2.2 Telecom Sector- The telecommunications industry, in particular, is undergoing a major swing as it assumes new tools such as the Internet of Things (IoT), Artificial Intelligence (AI), and Machine Learning (ML) to improve productivity, customer understanding, and service delivery. In India, the telecommunications industry is at the forefront of this transformation, and the inferences of Industry 4.0 are substantial [4].

The role of IoT in Telecommunications

In the telecommunications industry, IoT technology is used to monitor the following:

- network infrastructure
- track device usage,
- gather data on customer behaviour.

With the help of IoT, telecom companies can improve network performance, reduce downtime, and improve customer experience by offering personalized services based on individual usage patterns [4].

In general, the IoT market India is projected to reach US\$9.28 billion by 2025 [4], motivated by the growing acceptance of connected devices across various industries - healthcare, manufacturing, and transportation.

AI and ML in Telecommunications

In analysing vast ranges of data in real time, automation of various processes, AI and ML technologies are revolutionizing the telecommunications industry. For example, chatbots powered by AI can support customers in solving their queries and complaints. On the other hand, ML, algorithms can be utilized in optimizing network and preventing congestion. Study suggests [4] that the market of AI may reach US\$7.8 Billion by 2025.

Telecom companies of India need to grip Industry 4.0 technologies and strategies to remain competitive, adaptive to changing market dynamics, and driving innovation in the industries.

The consequences of Industry 4.0 for the Indian telecommunications industry can be noteworthy and may include [4]:

1. **Implementation of 5G Technology-** Indian telecom companies can influence 5G to enable technologies such as IoT (Internet of Things), AI (Artificial Intelligence), and AR/VR (Augmented Reality/Virtual Reality) applications in enhancing operational efficiency, automate processes, and enable new business models.
2. **Adoption of Network Virtualization and Software-defined Networking (SDN)-**With a consideration for more responsive, reachable, and automated network operations, adoption of Virtualizing networks and SDN can provide assistance to telecom companies for efficient operations.
3. **Utilization of Data Analytics and AI-driven Insights-** Indian telecom companies can influence data analytics and AI-driven insights as generated by adopting industry 4.0 (Industry 4.0 generates massive amounts of data from connected devices and processes) to derive actionable intelligence enabling them to optimize their operations, enhance customer experiences, and make data-driven business decisions.
4. **Heightened Customer Experience-** Indian telecom companies can embrace Industry 4.0 technologies to provide greater customer experiences and build customer loyalty. Industry 4.0 can be initiative to indulge innovations in customer experience by leveraging technologies such as AI-powered chatbots, self-service portals, personalized offerings, and seamless Omni channel interactions.
5. **Cybersecurity:** Considering critical consideration of cybersecurity and with the increased digitization and connectivity in Industry 4.0, Indian telecom companies may invest in sturdy cybersecurity measures which include threat intelligence, network security, and data protection, to

safeguard their networks, services, and customer data from probable cyber threats.

2.2.3 Healthcare

The healthcare space in India is favourable to the adoption of IoT, with factors that support and facilitate IOT implementation in healthcare. In achieving upgraded health outcome, the country needs talented group of doctors, engineers, highly skilled health workers and product designers.

With the prevalence of mobile devices across the country, digital communication is now available in the remotest of rural areas, establishing connectivity between different care settings [5].

IoT is making its presence felt in healthcare by connecting devices. This helps patients to keep track of their blood sugar, blood pressure etc.

Diabetacare’s smart glucometers is a typical example to demonstrate how patients can manage their diabetes better using IoT In the healthcare sector. The use of electronic health records (EHRs) is also gaining impetus. Already large section of population (mainly urban Indians) have become regular users of IoT-enabled devices like smart watches, fitness bands, monitoring patches, and heart rhythm detectors to monitor healthcare data [3].

2.2.4 The Indian automotive industry-The Indian automotive industry is at the forefront of adoption of key elements of Industry 4.0. Evolving technology, an increasing number of parts, growing competition and rising labour costs have forced the automotive firms to adopt the key components of Industry 4.0 such as robotics. The Indian automotive industry has taken some steps towards Industry 4.0. For example, [7]

- Bajaj Auto taken steps to initiate automation in 2010.
- it uses 100–120 “Co-bots” (collaborative robots) in its production processes.
- Maruti Suzuki manages 7 process shops and 5 assembly lines through nearly 1700 robots.
- Hyundai has taken steps to minimize its labor cost by using 400 robots
- The production lines of Tata Nano consist over 100 robots at Tata Motors.
- Renault is working in the field of automation to prevent accidents.
- The large two-wheeler manufacturers are using additive manufacturing for product designing of all two-wheeler parts for fitment and functional testing.

3.0 Significant Features of Industry 5.0

Industry 5.0 is regarded as a fifth industrial revolution in which consumers could gratify their individual requirements as per the tastes and expectations. Interestingly Industry 5.0 is all set to take the period when Industry 4.0 is still gaining popularity and yet to get matured specially in India. Adding the role of robots in performing repetitive tasks for mass customization in industry 4.0, industry 5.0 targets to perform mass personalization with the help of Artificial Intelligence providing higher autonomy to those collaborative robots.

Utilization of the creative intellectual capability of humans optimally, movement from mass production to custom manufacturing in manufacturing techniques and production system digitization and intelligentization adding sensors and intelligent device are the salient features of Industry 5.0 [6].

Industry 5.0 will generate a new types of job opportunities such as creative and innovative thinking, technology interface, managing COBOTs, creating artificial algorithms, and many more.

4.0 Adoption of Industry 4.0 and 5.0 towards in Indian Education Sector

It has been revealed in the world economic forum @Davos -2016, `the future of jobs ‘will undergo major shift from human to machine due to adoption of industry 4.0` [8]. There is rapid technological evolution of work shift from humans to machines where reports suggest that out of an average 71 per cent of the total task performed by humans across 12 selected sectors in 2018 has been reduced to just 58 per cent by 2022[8].

In view of the above, academic institutions of India should adopt effective human based courses/ programmes on knowledge and skill to drive Machine Intelligence and artificial intelligence with a mind to tackle efficiently future employability trends.

Table indicates the urgent requirement of paradigm shift from existing education system to future education system [8]

Present Scenario in Education System	Required Scenario in Education System
Demand based education	Supply based education
Competency based Education	Knowledge and Skill based Education
Degree accumulation and basic requirements	Purposefulness, Mindfulness leading to overall Happiness and wellbeing

Apart from incorporation of digital learning environment by both Educational Institutions and Industries efforts are also to be made for adoption/arrangement of the following sections [1]

1. Students positivity towards Industry 4.0 and 5.0
2. Administrative Willingness
3. Internal accessibility
4. Allocation of funds
5. Development of Infrastructure
6. Industrial collaboration

Professional education is largely aimed at imparting knowledge along with skills and abilities. The acquired knowledge, skills, and abilities should be in tandem with future jobs embedded with AI and ML through robotics and support entrepreneurial spirit among students.

5.0 Concluding Remarks

The perception of Industry 4.0 and 5.0 mentions to people working together with smart technologies and robots. The broader purpose these two industry 4.0 and 5.0 constitutes three core elements: human-centricity, sustainability and pliability [8].

On the other hand, higher education policies are to be carefully implemented in accordance with industry 4.0 and 5.0 as education work force would see changed roles or threatened.

Complex technologies will require new skill sets to be embedded with high tech human centric environment which would challenge traditional education life cycle. The high-tech human-centric environment will demand lifelong learning capabilities, high emotional, social and cultural intelligence, critical thinking, communication skills and knowledge to interact with and create new technologies that propel the life cycle. Industry 5.0 will require higher education institutions stakeholders in newer and more diverse roles like sophisticated researchers, innovators and knowledge workers. The time of human-machine collaboration will require new forms of work design and new ways of talent mix in the higher education industry. The future lines of academic research and innovation are in establishing indicators that allow academic institutions

a protocol to assess the economic dimension of sustainability, environmental impact and recycling [8]

References:

1. Stephanie M. Noble, Martin Mende, Dhruv Grewal, A. Parasuraman -The Fifth Industrial Revolution: How Harmonious Human–Machine Collaboration is Triggering a Retail and Service evolution - Journal of Retailing 98 (2022) 199–208, www.elsevier.com/locate/jretai .
2. <https://www.linkedin.com/pulse/smart-manufacturing-india-overview-sudhir-nerurkar/>
3. <https://proschoonline.com/blog/what-is-industry-4-0-and-is-india-prepared-for-the-change>
4. <https://www.ciiblog.in/industry-4-0-and-the-transformation-in-indian-telecom-industry>
5. <https://www.optum.in/thought-leadership/library/internet-healthcare-things.html>
6. <http://bweducation.businessworld.in/article/Industry-5-0-Are-Higher-Education-Stakeholders-Ready-For-Transformation/01-09-2022-444764/>
7. Bhat, T.B. - India and Industry 4.0 -ISID Working Paper 2020.
8. Madhu Chitkara, Varinder S Kanwar and Hitakshi Dutta- Redefining Indian Universities: An Insight of Education Sector towards Evolution of Industry 4.0 and 5.0- UNIVERSITY NEWS, 58(33) AUGUST 17-23, 2020

Teachers' Training

Teachers' Training During the period of January - April 2023: 4270 numbers of Technical Teachers have been trained, through various Short-Term Training Programmes, broadly in the areas of Content Updating, Management, Pedagogy and Professional Skill Development. A total of 65 training programs were conducted for the Teachers and Technicians of different Polytechnic colleges and Engineering colleges all over the Country during the 1st Quarter of the Year 2023.

List of Training Programmes (January-April, 2023)

Sl. No.	Program Code	Programme Title	Programme Coordinator	From	To
1	CU22	Introduction to Finite Element Method	Mithu Dey	02/01/2023	06/01/2023
2	CU26	Power Plant Engineering	Subrata Chattopadhyay	09/01/2023	13/01/2023
3	CU61	Application of MATLAB Control System, Image	Sagarika Pal	09/01/2023	13/01/2023

Sl. No.	Program Code	Programme Title	Programme Coordinator	From	To
		Processing and Fuzzy Logic Tool box			
4	CU84	Applied Chemistry Lab	Sailendra Nath Mandal	09/01/2023	13/01/2023
5	CU85	Non Traditional Machining Processes	Dipankar Bose	09/01/2023	13/01/2023
6	CU86	Applications of LABVIEW & MATLAB in Engineering	Soumitra Kumar Mandal	09/01/2023	13/01/2023
7	PS04	Entrepreneurship Development	Subrata Mondal	09/01/2023	13/01/2023
8	CU87	Mathematical Foundation of Computer Science	Kinsuk Giri & Samir Roy	09/01/2023	20/01/2023
9	SPL04	Ecology and Environmental Studies	Uday Chand Kumar	09/01/2023	20/01/2023
10	SPL23	Best Pedagogical Practices for Effective Teaching Learning Process	Urmila Kar	13/01/2023	15/01/2023
11	SPL24	Accreditation Process and NBA	Urmila Kar	17/01/2023	21/01/2023
12	CU88	Analysis and Design of Structures using latest version of a Structural Engineering Software	Santanu Bhanja	16/01/2023	20/01/2023
13	PS62	Laboratory practices on Civil Engineering Materials (<i>Concrete and Road Material</i>)	Mithu Dey	16/01/2023	20/01/2023
14	CU89	Fundamentals of Image Editing and 2D Animation	Indrajit Saha	16/01/2023	20/01/2023
15	PS64	Estimating and Costing of Non-conventional Energies	Sheela Yadav Rai	16/01/2023	20/01/2023
16	PS65	Advanced Pedagogy	Sukanta Kumar Naskar & Arpan Kumar Mondal	16/01/2023	27/01/2023
17	SPL26	Student Mentorship	Habiba Hussain	19/01/2023	25/01/2023
18	PS66	Thesis and Research paper writing	Rayapati Subbarao	30/01/2023	03/02/2023
19	CU73	Object Oriented Design & Programming in C++	Rajeev Chatterjee & Samir Roy	30/01/2023	03/02/2023
20	PS67	NBA Accreditation and SAR Preparation for Polytechnics	Arpan Kumar Mondal & Ranjan Dasgupta	30/01/2023	03/02/2023
21	CU82	PLC Programming and its Applications	Sagarika Pal	30/01/2023	03/02/2023
22	PS68	Renewable Energy Sources and Emerging Technologies	Sheela Yadav Rai	06/02/2023	10/02/2023
23	PS69	NBA Accreditation and SAR Preparation	Rayapati Subbarao	06/02/2023	10/02/2023
24	MGT11	Research Methodology	Chandan Chakraborty	06/02/2023	10/02/2023
25	SPL21	Advanced Pedagogy	Urmila Kar	06/02/2023	17/02/2023
26	CU92	Machine Learning with PYTHON	Kinsuk Giri & Chandan Chakraborty	13/02/2023	17/02/2023
27	CU93	LABVIEW Application in Engineering	Sagarika Pal	13/02/2023	17/02/2023
28	PS70	Innovation and Start up in Higher Education Institutions	Prasanta Sarkar	13/02/2023	17/02/2023
29	PS35	Development of Laboratory Instruction and Manual	Dipankar Bose	13/02/2023	17/02/2023
30	CU94	Application of AutoCAD in Engineering & Basic Sciences	Mithu Dey	20/02/2023	24/02/2023
31	CU96	Fundamentals of Technology Enabled Learning	Indrajit Saha	20/02/2023	24/02/2023
32	PS71	FDP on Life skill Development	D. P. Mishra & Sukanta Kumar Naskar	20/02/2023	24/02/2023
33	PS72	NBA Accreditation and SAR Preparation for Polytechnics and Engineering Colleges	Arpan Kumar Mondal & Ranjan Dasgupta	27/02/2023	03/03/2023
34	SPL27	Disaster Management	Uday Chand Kumar	27/02/2023	03/03/2023
35	CU02	Introduction to SCILAB	Kinsuk Giri	27/02/2023	03/03/2023
36	PS73	National Education Policy (NEP) 2020 – Reforms in Higher Education	Urmila Kar	27/02/2023	03/03/2023
37	PS79	NBA Accreditation with Document Preparation	Rayapati Subbarao	06/03/2023	10/03/2023
38	CU98	Refresher Course of LABVIEW and MATLAB Applications	Sagarika Pal	06/03/2023	10/03/2023
39	CU100	Vibration and Its Effects on Engineering Systems	Nirmal Kumar Mandal & Santanu Bhanja	06/03/2023	10/03/2023
40	CU101	Teaching – Learning Process using Instructional Media	Subrata Chattopadhyay & Sagarika Pal	13/03/2023	17/03/2023

Sl. No.	Program Code	Programme Title	Programme Coordinator	From	To
41	CU65	Topics In Algorithm	Ranjan Dasgupta & Samir Roy	13/03/2023	17/03/2023
42	SPL29	NEP-2020	Urmila Kar	13/03/2023	17/03/2023
43	PS74	Induction Training	Habiba Hussain	13/03/2023	17/03/2023
44	SPL20	Use of ICT in Education & Teaching and Research	Rajeev Chatterjee & Rayapati Subbarao	13/03/2023	17/03/2023
45	SPL09	Rethinking Curriculum in line with NEP 2022	Habiba Hussain	20/03/2023	22/03/2023
46	CU91	Applied Optimization of Engineering Systems with MATLAB	Nirmal Kumar Mandal	20/03/2023	24/03/2023
47	PS76	Problem-Based Learning-Towards Advanced Pedagogy	Indrajit Saha, Sagarika Pal, Kinsuk Giri & Arpan K. Mondal	20/03/2023	24/03/2023
48	PS49	Induction Training	Sheela Yadav Rai	27/03/2023	31/03/2023
49	CU103	Formal Languages and Automata	Samir Roy	27/03/2023	31/03/2023
50	CU104	ICT Tools for Effective Teaching and Learning	Kinsuk Giri & Arpan Kumar Mondal	27/03/2023	31/03/2023
51	CU47	Introduction to Technology Enabled Learning	Indrajit Saha	06/03/2023	10/03/2023
52	CU48	Advanced Digital Electronics	Subrata Chattopadhyay	27/03/2023	31/03/2023
53	PS03F	Professional values and ethics	Mithu Dey	03/04/2023	07/04/2023
54	PS04F	Advanced Pedagogy	Arpan Kumar Mondal & Sukanta Naskar	03/04/2023	14/04/2023
55	CU03A	Modern Control	Prasanta Sarkar	10/04/2023	14/04/2023
56	MGT01C	Laboratory Safety Management	Subrata Mondal	10/04/2023	14/04/2023
57	PS06C	Bloom's Taxonomy Based Question Paper Generation	Dipankar Bose	10/04/2023	14/04/2023
58	PS09C	NBA Accreditation and SAR Preparation	Arpan Kumar Mondal	17/04/2023	21/04/2023
59	PS11C	ICT Tools for Assessment	Kinsuk Giri	19/04/2023	21/04/2023
60	SPL01C	NBA Accreditation and SAR Preparation	Rayapati Subbarao	24/04/2023	28/04/2023
61	CU05F	Introduction to Coding Theory	Rajeev Chatterjee	24/04/2023	28/04/2023
62	CU07F	Ecology and Environment	Uday Chand Kumar	24/04/2023	28/04/2023
63	CU08F	Power Electronics and Drive System	Soumitra Kumar Mandal	24/04/2023	28/04/2023
64	CU09F	Power Generation from Energy Resources	Sheela Yadav Rai	24/04/2023	28/04/2023
65	SPL03F	Effective Teaching Learning Process Using Instructional Media	Subrata Chattopadhyay	26/04/2023	28/04/2023

List of programmes in which Prof. Debi Prasad Mishra, Director has delivered a talk

A. In programmes organized by NITTTR, Kolkata

1. Celebration of 58th Foundation Day of NITTTR, Kolkata on 11th January 2023
2. One day National Awareness Workshop on National Credit Framework (NCrF) (online mode) on 03.03.2023, from 11 am onwards by Prof. Sukanta Kumar Naskar
3. AIR POLLUTION: A Driver for Global Climate Change, Adverse Human Health and Ecosystem Damage on 21st March 2023 at 5:00 pm talk

delivered by an Eminent speaker Dr. Ravi Kant Pathak, PhD, Associate Professor, University of Gothenburg, Sweden

4. National Seminar (web) on Innovation, Incubation and Entrepreneurship Development on 22nd March 2023 at 10:00 AM by Prof. Subrata Mondal

B. In programmes organized by other institutions

1. National Conference on Classical Indian Astronomy & Mathematics on 4th & 5th February 2023 organized by Satananda Institute of Astronomy, Odisha
2. Chief Guest of Annual IP Meet 2023 29-30 April 2023 organized by WBNUJS

Invited Lectures by Faculty Members

- **Dr. Habiba Hussain** delivered an invited talk on **Assessment & Rubrics** on 7th February 2023 in an online Refresher Course on Design & Development of Outcome-Based Curriculum in Higher Education (Interdisciplinary), organized by UGC-Human Resource Development Centre, Guru Ghasidas Vishwavidyalaya, Bilaspur, C.G. during 30th January to 11th February 2023.
- **Dr. Kinsuk Giri** delivered invited talk on “Mathematical and Statistical Problem-Solving using ML”, in **Two Days Workshop on AI and ML, March 29, 2023, Amity University, Kolkata, India**
- **Dr. Kinsuk Giri** delivered invited talk on “Writing in Latex, Python programming and Machine learning”, in **Ad-on Program for NAAC, March 23, 2023, Malda College, Malda, India**
- **Prof. Prasanta Sarkar**
 1. 23/01/2023 Innovation and start up in higher Educational Institutions. FDP on Technology Transfer from Lab to Society organized by Mizoram University.
 2. 03/03/2023 National Credit Framework NSQF (Vocational Education and skill training); workshop on National Credit Framework
 3. 22/03/2023 Innovation and start up policy. National seminar (web) on Innovation Incubation and Entrepreneurship Development.
- **Keynote** address by **Dr. Dipankar Bose** (online) on “Opportunities and Challenges in Implementing Industry 5.0 -Indian Perspective” on 04.03.2023 in International Conference on Industry 5.0 Revolution, Innovation and Efficiency (ICIRIE 2023) organized by Mechanical Engineering Department Swami Vivekananda Institute of Science & Technology, Kolkata.
- **Dr. Santanu Bhanja** inaugurated the National Conference on Sustainable Engineering (NSCE-2023) on 16th March 2023 organized by the Department of Civil Engineering, Dr Sudhir Chandra Sur Institute of Technology and Sports Complex, Dum Dum, Kolkata – 700074. Acted as the Keynote Speaker on the inaugural session and the title of the presentation was Sustainable Reinforced Concrete.

Publications

Journals

- Snigdha Chowdhury Kolay, Mandakinee Bandyopadhyay, **Subrata Chattopadhyay**, “*Design and Testing of Digital Logic Gates using HCS Macro-model*”, IEEE Transactions on Circuits and Systems II: Express Briefs, vol. 70, issue 3, pp 1134-1138, 2023.
- Suman Das, Subir Bhadra, Srijan Bhattacharya, **Subrata Chattopadhyay**, “*Ionic Polymer Metal Composite based Smart Tongue using Machine Learning*”, IEEE Sensors Letters, vol. 7, issue 2, pp. 1- 4, 2023.
- Subrata Pandey and **Soumitra Kumar Mandal**, “*Biometric Artificial Skin for Robots, A Review*”, Indian Journal of Engineering, vol. 1, pp. 1-10, February 2023.
- **Rayapati Subbarao**, “*Outcome Based Approach Applied to a Mechanical Engineering Course to Advance the Teaching-Learning Processes*”, International Journal of Engineering Education, Vol. 39 (2), pp. 369–375, 2023. (SCI, Scopus indexed)
- **Rayapati Subbarao**, “*Computational Studies on a Two-Stage Axial Flow Turbine Aiming Flow Losses and Performance*”, Fluid Mechanics and Fluid Power (Vol. 2), Lecture Notes in Mechanical Engineering, pp. 141-146, April 2023. (Scopus indexed)
- **Rayapati Subbarao**, “*Computational Studies on the Flow Aspects Through the Nozzle in Case of a Counter Rotating Gas Turbine Stage*”, Fluid Mechanics and Fluid Power (Vol. 3), Lecture Notes in Mechanical Engineering, pp. 375-380, April 2023. (Scopus indexed)
- **Subrata Mondal**, Priya Mondal and Debi Prasad Mishra, “*Research Progress on Ceramic Nanomaterials Reinforced Aluminum Matrix Nanocomposites*”, Materials Science and Technology, <https://doi.org/10.1080/02670836.2023.2187153>, 2023, SCI, Impact Factor 2.060.

Conferences

- Susmita Singh, **Kinsuk Giri**, Adrita Chaudhury, Tanya Nishad, Debasmitta Paul and Priya Poddar, “*Modelling of Gas Diffusion Layer (GDL) of Polymer Electrolyte Membrane (PEM) Fuel Cell- A*

Computational Approach"; IRRET-2023, ICET, Malda, West Bengal, India, April 9 -10, 2023

- **Sagarika Pal**, Mandakinee Bandyopadhyay, Snigdha Chowdhury Kolay, Subrata Chattopadhyay, *"Remote Air Quality Sensing and Temperature Monitoring System using GSM for Smart City Application"*, 2023 International Conference on Artificial Intelligence and Smart Communication (AISC)/IEEE Explore, pp. 338-342, 2023.
- Snigdha Chowdhury Kolay, Amrita Chatterjee, **Subrata Chattopadhyay**, *"Design and Simulation of Reversible Logic Gate Using HCS Macro-model"*, International Conference on Electronic and Photonic Integrated Circuits, in Press.
- A paper on Revisiting Vocational Education and Training in India written by **Dr. S. K. Naskar** jointly with Dr. R. Karmakar was presented in the 2nd International Conference on Best Innovative Teaching Strategies- ICON- BITS 2023 held at BITS Pilani during 9-11 Feb. 2023
- Geetika Salwan, **Rayapati Subbarao** and Subrata Mondal, *"Effect of compaction pressure and sintering time on characteristics of nickel based superalloy"*, 322, 2nd International conference on Recent Advances in Materials, Manufacturing and Machine Learning (RAMMML-2023), Nagpur, India, Feb 2023.
- Geetika K. Salwan, **Rayapati Subbarao**, Subrata Mondal, *"Investigation on Compaction Pressure and Sintering Temperature Suitable for Nimonic 90 Superalloy"*, ICMMM2023-00794, International Conference on Materials Manufacturing and Modelling (ICMMM - 2023), VIT University, Vellore, Mar 2023.
- Anasuya Mondal and **Santanu Bhanja**, *"Shortcomings of Shear Wall Design as per Is 13920:2016"*, UKIERI Concrete Congress, 2022, Proceedings of the International UKIERI Concrete Congress, 14 - 17 March 2023, ISBN: 978-93-5812-834-5.
- Jayanta Nath Chowdhury and **Santanu Bhanja**, *"Shortcomings of SP-16:1980 regarding design of R.C compression members"*, UKIERI Concrete Congress, 2022, Proceedings of the International UKIERI Concrete Congress 14 - 17 March 2023, ISBN: 978-93-5812-834-5.

59th Foundation Day Programme of NITTTR Kolkata

The 59th foundation day of NITTTR Kolkata was observed on the 11th of January 2023.



The programme was presided over by Prof. Ajoy Kumar Ray, Former Director, IEST Shibpur, W. B. as the chief guest. In his inaugural address, Prof. Ray congratulated all the members of faculty and staff

for having served the technical education for more than half a century. He expressed his concern over sustainability in all spheres of human life at the present moment.



The Guest of Honour, Dr. Sham Arjunwadkar, Chairman, BoG, National Institute of Advanced Manufacturing Technology (NIAMT), Ranchi joined the inaugural session virtually and invited NITTR Kolkata to collaborate with industries and other organisations across the nation for reaching the society at large. The Chairman, BoG, Padmashri Shri Harshavardhan Neotia could not join due to his prior engagement but congratulated all the employees and sent his good wishes and greetings.



Under the leadership of the Director of the institute, Prof. Debi Prasad Mishra, a panel discussion was also conducted on the topic 'Rejuvenation of NITTR Kolkata for a flourishing future'. The panelists, namely Prof. Debi Prasad Mishra, Prof. Ajoy Kumar Ray, Prof. Shyamal Majumdar, who discussed face-to-face in the forum and Prof. S. Mohan, present VC, Puducherry Technological University who joined virtually, opened up new vistas for NITTR Kolkata to contribute, particularly, in areas like digital & online pedagogy, robust curriculum to meet the global challenging

needs in TVET, skill development, research in Engineering education and providing training in emerging multidisciplinary areas.



The cultural magazine of the institute, 'Bharatiya Kala aur Shilpa' (BKAS) was inaugurated by the guests on this day. The Director, Prof. Debi Prasad Mishra congratulated one and all and greeted the ex-employees (faculty and staff) who attended the programme. He expressed great optimism in the capability of the members of the institute and encouraged all to carry forward the Institute to greater heights.

1st Alumni Meet

With the approval from the competent authority, 1st Alumni Meet for the ex-M.Tech students was held on 22.01.2023 at Mini Auditorium of NITTTR, Kolkata. It was the initiatives by Dr. S.K.Naskar, Coordinator of Students' Alumni Cell of NITTTR, Kolkata with the support and encouragement of the Director Prof. Debi Prasad Mishra.



Thirty ex-students, few current students and faculty members of various departments attended the event. The coordinator of students' Alumni Cell did the initiation of the meet. In the welcome address, honorable Director of NITTTR, Kolkata highlighted the various ways through which the alumni can help the institute.

All head of the departments gave speeches highlighting the necessity of conducting such meet from time to time and also indicating departmental facilities.

During the open interactive session, participants provided feedback about their past days at NITTTR, Kolkata and wishes to conduct such event from time to time.

Finally, the meet was ended with vote of thanks proposed by Dr. R.P. Subba Rao.



Workshop on National Credit Framework (NCrF)

One day National Awareness Workshop on National Credit Framework (NCrF) through online mode was organized by NITTTR-Kolkata on 3rd March 2023. Following speakers were invited to give the talk:

- Prof. Prasanta Sarkar, Professor, NITTTR, Kolkata
- Prof. Chandan Chakraborty, Professor, NITTTR, Kolkata
- Prof. Ranjan Dasgupta, Professor, NITTTR, Kolkata
- Prof. S. Viswanadha Raju, Senior Professor, Jwharlal Nehru Technical University (JNTU)
- Dr. Biswajit Saha, Director (Skill Training), CBSE, New Delhi

The workshop was initiated by stating the objectives by Dr. S.K.Naskar, Associate Professor and HOD of the department of Education and Management and the workshop coordinator.

Director In-charge Prof. Prasanta Sarkar gave the welcome address and introductory speech. In his speech, he mentioned the need of unified framework of School education, Higher Education and Vocational education. Vocational education as on now being not considered into mainstream education system. According to him, the authorities like UGC, AICTE etc., make lot of regulatory norms and mechanism in line with NEP 2020.

First speaker Prof. Ranjan Dasgupta highlighted about the Indian credit system. According to him, access of quality education is important along with transfer credit, after following the British legacy, education system modified in many ways. Previous policy of education was mostly in paper, not in practice. Integration of knowledge and skill is very essential according to him. Utilization of demographic dividend of our country is most important and regulatory frameworks and norms be aligned accordingly along with development of inclusive education system. He also discussed about basic concept of credit system. Dr. Biswajit Saha in his informative session provided the discussed about the document National Credit Framework (NCrF). According to him, present time is very crucial with respect to NEP 2020 and NCrF is a guiding document. IIT, IIMs have already adopted the system similarly university and school education system it is equally important. This is a comprehensive

document spelt about how transfer the credit from institutions to institutions and courses to course. This framework work document was prepared by involving various stakeholders and incorporating their suggestions. Present education system particularly in school and vocational education system the there is no scope to give credit to prior learning and the concept of ME- ME (Multipoint entry and Exist system) and hence provisions of flexibility has given due importance in NCrF. Allocation of credit for thinking time along with other academic activities of students (learning hours). He pointed out the three dimensions of NCrF are: Academic, Skill and experiential learning proficiency with are integrated.

Professor Chandan Chakraborty in his session highlighted the concept of Choice Based Credit System (CBCS), where student choice has been given priority; in this context, he mentioned the recommendations of Jaspal Committee in higher education system. According to him NEP 2020 and CBCS has lot of similarities like introduction of flexibility, transfer of credit, inclusive education, less rigidity in curriculum etc. He discussed the various categories of courses, like, core course, foundation course and elective courses with appropriate examples.

Prof. S. Viswanadha Raju talked about how to calculate credit, mobility of credit system and definitions of credit system along with how to access it. Student mobility form one branch to another branch one institute to another institute and one country to another country are the key points of entire NCrF. He categorically and illustratively discussed the different levels of NCrF structure. He mentioned few benefits and advantages of NCrF, which are as follows:

Mobility, equivalence, removal of hard separation between general and vocational education system, multi point entry and exist system, lifelong learning, integration of skill with education.

Professor Prasanta Sarkar discussed on national skill qualification framework (NSQF) in a detailed way. According to him, entire effort has been made to bring non-formal education into mainstream of education through this framework. He elaborately

discussed the different levels of NSQF where all enabling factors have been taken into consideration.

The workshop ended with a vote of thanks proposed by Dr. Sukanta Kumar Naskar the coordinator of the workshop.

Around 120 participants from different states joined the workshop.

13th Inter NITTTR Sports Meet held at NITTTR, Chennai, 13th-16th March 2023

The 13th of March,2023 witnessed a spectacular display of resilience, leadership and accountability as NITTTR, Chennai conducted the inaugural ceremony of the 13th Inter NITTTR Sports Meet. Directors and representatives of all the four NITTTRs occupied the dais. The main chief guest was Dr. Natarajan, sprinter, who represented India in national and international events. Shri. V.S.S. Kumar, Chairman, BoG of NITTTR, Chennai was also present as guest of honour. The orchestra band played the music and accompanied all the athletes to the podium. Enthusiasm of the participants, organizers and other delegates was so high that the whole podium and surroundings could feel the vibrations of joy.







Many events were planned during the meet and from 13th -16th March 2023, all had witnessed friendly and challenging competitions. Faculty and staff from all the

four NITTTTRs participated in the Sports Meet. There were 15 events under 7 different games, i. e. Badminton, Table Tennis, Carrom, Chess, Auction Bridge, Volleyball and 100 Meter Race. Twenty-one participants from NITTTTR Kolkata participated in different events. NITTTTR Kolkata achieved third position in overall, by winning 4 Gold Medals, 4 Silver Medals and 2 Bronze Medals. There has been no female participant participated on behalf of the Institute.

NITTTTR Chandigarh won the Championship Trophy, topping the position in the medals' tally. NITTTTR Bhopal came in the second position, while NITTTTR Chennai settled with 4th Position. A cultural program was organized on the first day in the evening. Participants from different NITTTTRs performed dance to the tunes of recent movie hit songs. Few participants sang songs in Hindi, Tamil and other languages. Local organizers presented a drama to showcase the Tamil culture, manners and behaviour. Audience enjoyed the drama, which lasted for long and because of the unique moments it had. Also, a short trip to Mamallapuram was organized by the host, NITTTTR Chennai. Participants spent some relaxed time by visiting the shore temple of Lord Vishnu. Also, they could witness the artwork and sculptures of various famous people, prepared by the local artists. On the last day, a valediction program was held in Dr. APJ Kalam Auditorium. All the sports' coordinators of the four NITTTTRs and the Director, NITTTTR Chennai occupied the dais. Medals were presented to the winners of the all the sports. Gifting the overall champions' trophy and other prize distributions were held in a very grand way. Finally, the baton to hold the 14th Inter NITTTTR Sports Meet was handed over to NITTTTR, Chandigarh. The programme ended with all singing the national anthem, '*Janagamana adhinayaka jayahe bhārata bhāgya vidhātā*'. Participants left the venue with all the cheers, hoping to meet in Chandigarh, next year.



National Seminar on Innovation, Incubation and Entrepreneurship Development

Under the patronage of the Director, Prof. Debi Prasad Mishra, the National Seminar (web) on “**Innovation, Incubation and Entrepreneurship Development**” was organized on 22nd March 2023 by a team of the National Institute of Technical Teachers’ Training and Research (NITTTR) Kolkata, Coordinated by Dr. Subrata Mondal, Dept. of Mechanical Engineering, NITTTR Kolkata. Major aim of the seminar was to bring together researchers, students, faculty members, technical staffs and industry personnel to share their knowledge in the fields of innovation, intellectual property right, incubation and entrepreneurship developments.

Prof. Debi Prasad Mishra, honorable Director of NITTTR Kolkata welcomed the guests and participants. In the welcome speech, Prof. Mishra has discussed purpose of the seminar, teachers and teaching-learning process, and importance of entrepreneurship. He has stressed upon development while protecting the nature and environment. Prof. Mishra further pointed out that the country needs to play a major role in the international arena and to be the leader in the next twenty-five years.

Dr. R. Swaminathan, CEO, Indian Institute of Technology (IIT) Indore ACE Foundation and Prof-In-Charge Centre for Entrepreneurship Education and Development gave talk on **Funding Opportunities for Incubators and Early-Stage Entrepreneurs**. Prof. Prasanta Sarkar, Professor, Department of Electrical Engineering, NITTTR, Kolkata has discussed on **Innovation and Start-up Policy**. The presentation on **Lab to Commercialization: The Journey** has been delivered by Shri. Joseph Paul Arackalan, General Manager, Incubation Centre, IIT Patna. Shri. Rajeev Pandey, Chief Finance Officer (CFO), IIT Indore Advanced Centre for Entrepreneurship (ACE) Foundation presented on **Valuation of Start-ups**. The last talk has been delivered on **Development of business idea** by Dr. Subrata Mondal, Coordinator of the Seminar, Associate Professor & Head, Department of Mechanical Engineering, NITTTR Kolkata. Eighty-nine (89) participants have been participated in the programme from all over the country. The National Seminar (web) has been organized successfully with the active support and help from Dr. Rayapati Subbarao, Associate Professor, Department of Mechanical Engineering, NITTTR Kolkata, and Dr.

Arpan Kumar Mondal, Assistant Professor, Department of Mechanical Engineering, NITTTR Kolkata.

Celebration of 132nd Ambedkar Jayanti

NITTTR, Kolkata, virtually celebrated 132nd Ambedkar Jayanti on 14th April 2023 under the Coordination of Prof. S. N Mandal, Professor and Head, Department of Civil Engineering to mark the birth anniversary of Dr. Bhim Rao Ambedkar, the principal architect of the Constitution of India

The event commenced at 5.00 p.m. with welcome address to the gathering by Prof. S. N. Mandal. Then Prof. Mandal mentioned the impact and significance of Ambedkar Jayanti. Prof. S. N. Mandal in his address highlighted the life & contributions of Dr. Ambedkar and how he becomes a famous personality through excellent academic achievements with limited resources & challenges. He said, “Ambedkar will always be alive in the hearts of Indian for his great deeds”.

Prof. P. Sarkar, Professor, Department of Electrical Engineering in his speech, mentioned Babsaheb an Indian jurist, politician, philosopher, anthropologist, historian, and economist who was a key architect of the Indian Constitution. Prof Sakar also highlighted the Financial reforms initiated by Dr Ambedkar and said that the RBI is the creation of his dream.

Prof. S. K. Naskar, Professor and Head, Department of Education and Management in his speech, mentioned the importance and significance of Dr. Babasaheb Ambedkar’s political & educational careers. He also said that “the contribution of Ambedkar towards protection of Dalits is inspiring”

Mr. Biprajit Das, M.Tech Student of Civil Engineering mentioned “Ambedkar’s life and actions have been a source of inspiration for crores all over the world”.

Mr. Shubham Gautam, M.Tech Student of Electrical Engineering, highlighted the importance and significance of Dr. Babasaheb Ambedkar educational careers. He also mentioned contributions of Babasheeb to the uplift of lower caste people.

Mr. Gourab Ganguly, M.Tech Student of Mechanical Engineering mentioned “Ambedkar dedicated his life to the empowerment of the deprived and the exploited sections of society”.

Mr. P. D. Siyodia, Co-Coordinator and Sr. Technical Assistant, Department of Civil Engineering mentioned “Ambedkar was a legal luminary, visionary statesman, outstanding constitutional expert, brilliant parliamentarian & social reformer. He was the voice of

the socially oppressed and dedicated his life to the upliftment of the marginalized sections of society. His iconic life and noble thoughts continue to guide the nation.”

Prof. Debi Prasad Mishra, honorable Director of NITTTR, Kolkata, in his speech, mentioned great humanistic value and intellectual capability of Dr Ambedkar and also the significance of Baba Saheb's life. “We should take inspiration from the life of this great son of India. A true homage to Dr Ambedkar would be to develop our country on the principles of ‘social and economic justice”, the Director said. He said that Dr BR Ambedkar has set an example for us through his sincerity, dedication and hardwork.

At the end, a vote of thanks has been given by Mr. P. D. Siyodia, Co-coordinator of Dr. B R Ambedkar Jayanti Celebration Committee

Miscellaneous

List of educational resources developed/video coverage by LRC

Sr.	Item	No.
1	Educational Video Film	04
2	Virtual Lab Video of CSE dept. by Dr. R Chatterjee	01
3	Videos recording of the Institutional Program	04
4	Intro video for Swayam MOOC course “Resilient Pedagogy” By Dr. U Kar and Dr. H Hussain	01
5	E-STTP video for “Engineering Pedagogy” by Dr. N K Mondal, ME Dept.	04

Awards

- Prof. Rayapati Subbarao participated in the 13th Inter-NITTTR Sports Meet, held at NITTTR, Chennai from 13th -16th March 2023. Won 3rd place (Bronze medal) in Volleyball.

Conference attended

- Habiba Hussain presented a paper titled, “The shift to outcome-based assessment – teachers’ perception” in the International conference in Best innovative teaching strategies organised by BITS Pilani during 9th to 11th February 2023

Workshop attended

- Prof. Rayapati Subbarao attended the Curriculum workshop for Diploma Programmes of Arunachal Pradesh as expert, conducted from 19th -21st Jan 2023, held at the office of DTE, Itanagar.
- Prof. Rayapati Subbarao attended the Curriculum workshop for Diploma Programmes of Meghalaya, as expert, conducted from 20th – 22nd March 2023.

Workshop conducted

- Vivekanda Vijnan Mission, Kolkata chapter of Vijnan Bharati, conducted two days national workshop for technical teachers on 25-26th Feb 2023 jointly with NITTTR, Kolkata at NITTTR-Kolkata. Dr. S. K. Naskar was the coordinator from NITTTR, Kolkata

Other activities

Activities of Institutions’ Innovation Council (IIC):

Under the patronage of the Director, Prof. Debi Prasad Mishra, the National Institute of Technical Teachers’ Training and Research (NITTTR) Kolkata’s IIC cell has been established to create a vibrant local innovation ecosystem for Scouting Ideas, Pre-incubation of Ideas and other activities related to the innovation, incubation & startups. Recently, IIC web portal (<http://www.nitttrkol.ac.in/iic.php#top>) has been developed with the help of institute’s media cell. IIC has conducted a National Seminar (web) on “Innovation, Incubation and Entrepreneurship Development” on 22nd March 2023. Eighty-nine (89) participants participated in the programme from all over the nation. Presenters of the national (web) seminar were from Indian Institute of Technology (IIT) Patna, IIT Indore and NITTTR Kolkata.

In-House FDP

An In House FDP had been conducted by Prof. Subrata Chattopadhyay at SCS(A) college, Puri during 26- 28 th April 2023 entitles “Effective Teaching Learning Process using instructional media” against the proposal received from the principal of SCS (A) College, Puri. Faculties from different disciplines participated in this program and nice feedback received from them. The inauguration ceremony was published in Odia Daily News Papers (The Samaja and The Amruta Dunia) on dated 27th April 2023.



Seminar attended

Prof. Rayapati Subbarao attended the National Seminar on “Innovation, Incubation and Entrepreneurship Development”, held on 22nd March 2023 and conducted by NITTTR Kolkata.

Panel discussion

Dr. S. K. Naskar was invited and acted a panelist for the Trainers Training Programme (TOT) conducted by National Academy of Direct Taxes (NADT), Nagpur on 21.3.23. the theme of the panel discussion was – issues in online training.

OTHERS

e-classroom Demonstration organized by Learning Resource Centre (LRC)

LRC has developed an e-classroom at Chanakya Bhavan (1st Floor) on the supervision of Dr. Chandan Chakraborty having facilities like online/ offline/ hybrid class and recording facility with interactive projector under the encouragement and leadership of our hon'ble Director. A demo session on 12-01-2023 at 5:00 PM has been organized to demonstrate the same to all the faculty members.



160th Birth Anniversary of Swami Vivekananda

NITTTTR Kolkata, celebrated the 160th birthday of Swami Vivekananda on 12th January 2023 at 12.30 PM in front of the statue of Swami Vivekananda. Faculty members, Staff members and students and trainees were present there.



Birth Anniversary of Netaji Subhash Chandra Bose and Parakram Diwas

NITTTTR Kolkata celebrated the Birth Anniversary of Netaji Subhash Chandra Bose by garlanding his portrait at Sri Ramakrishna Paramahansa Auditorium (Mini Auditorium) and Parakram Diwas on 23rd January 2023 at 12 Noon. Employees, trainees and students of the Institute were present at the event.



Observance of silence for two minutes from 11.00 AM on 30th January, 2023 (Martyrs' Day) in the memory of those who sacrificed their lives during struggle for India's freedom

The Institute observed Martyrs' Day on 30th January 2023 to pay homage in the memory of those who sacrificed their lives during the freedom struggle of India. Two minutes' silence from 11:00 AM to 11:02 AM were observed in the memory of martyrs' who have laid down their lives during the freedom struggle of our country. The event was held in Sri Ramakrishna Paramahansa Mini Auditorium at Sarvepalli Radhakrishnan Bhavan of the Institute. Employees and students were participated there.



Special lecture on “Air pollution: A Driver for Global Climate Change, Adverse Human Health and Ecosystem Damage”

An Awareness Lecture/ Talk was organized on “AIR POLLUTION: A Driver for Global Climate Change, Adverse Human Health and Ecosystem Damage” on 21/03/2023 at 5:00 pm at Shri Ramakrishna Paramahansa Auditorium (Mini Auditorium). The Talk was delivered by an Eminent speaker Dr. Ravi Kant Pathak, PhD, Associate Professor, University of Gothenburg, Sweden. Introductory Speech was given by Prof. Debi Prasad Mishra, Director, NITTTTR, Kolkata.





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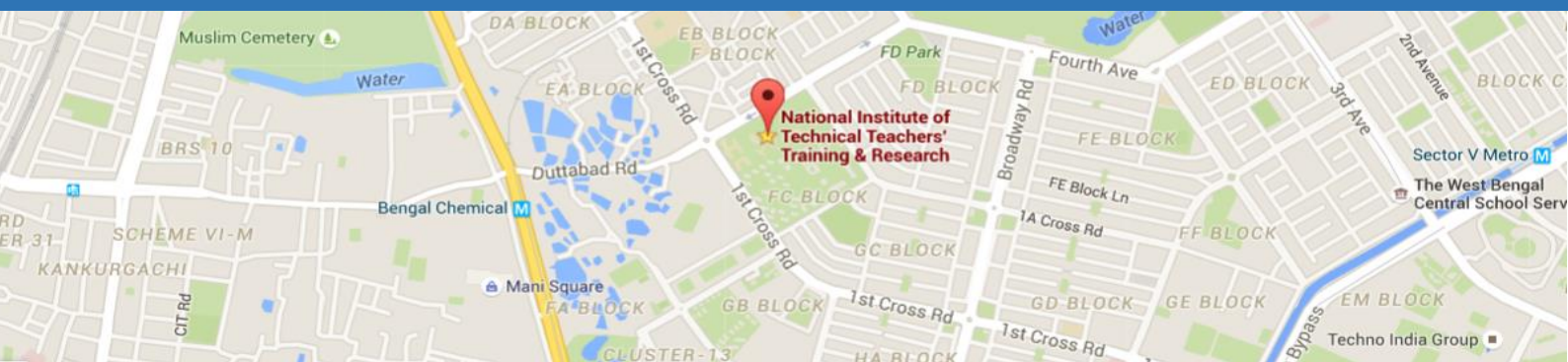
Visit us at www.nittrkol.ac.in

How to Reach NITTR, Kolkata

The Institute is located near Labony Bus Stand (Sector-III), FC Block in Salt Lake City, Kolkata 700106 and can be reached by taxi from Netaji Subhas Chandra Bose International Airport and also from Howrah, Shalimar, Sealdah and Kolkata Railway Stations.

“There is no end to education. It is not that you read a book, pass an examination, and finish with education. The whole of life, from the moment you are born to the moment you die, is a process of learning”

– Jiddu Krishnamurti



Distance:

- From Howrah Railway Station: **42 min** (8.1 km) via Maniktala Main Road
- From Sealdah Station: **26 min** (7.4 km) via Beliaghata Main Road and Broadway Road
- From Kolkata Railway Station: **16 min** (4.8 km) via Canal Circular Road
- From Shalimar Station: **38 min** (18.8 km) via Parama Island Flyover
- From Netaji Subhas Chandra Bose International Airport: **27 min** (11.5 km) via Kazi Nazrul Islam Sarani/VIP Road

Google map link: <https://goo.gl/maps/F7gssJoeqxSvffqf9>



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