NITRA NEWS

...with industry always

Issue: April-June 2024

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Editorial Structure

FROM DIRECTOR GENERAL'S DESK

Dear Patrons,

Friends, as usual this quarter has also been filled with various activities both for NITRA and its academic wing NITRA Technical Campus. As you know that this year NITRA is celebrating its Golden Jubilee Year (1974-2024), hence as a measure for commemorating this special year, we are set to launch a golden jubilee booklet series, containing 13 different booklets on various topics from Technical Textiles. We are very happy that two of the booklets namely Composites and Industrial Textiles are ready and booking is open for these two editions. Rest of the booklets will follow soon.

During this quarter, NITRA signed two MoUs with M/s. North Eastern Handicrafts & Handlooms Development Corporation Ltd (NEHHDC), under Ministry of Development of North Eastern Region (MDONER) for working jointly on mutually agreed textile projects on sustainable fibres for their extraction / regeneration, processing and product development activities as project associate / industry partner. In addition to this another MoU is signed with Tantu Red River Projects, Guwahati, Assam for Technology Transfer for Extraction of Pineapple Fibre.

NITRA and its academic wing NITRA Technical Campus celebrated International Yoga Day at its campus in Ghaziabad. Staff members, faculty members and students have actively taken part in this yoga-session in large numbers and practiced yoga as per the instructions of the experts. Similarly, the World Environment Day is also observed in the month of June. The management, faculty and students of the institute planted saplings inside NTC Campus to mark the occasion. A special technical session on how to reduce environment pollution was also organized for the students.

NITRA's academic wing NITRA Technical Campus (NTC) organized its 3-day intra-college annual *Sports Meet 2024* during this period at NTC Campus, Ghaziabad. NTC has always believed in developing its students' physical and mental health viz-a-viz their academic development. Keeping that in view, this event is organized annually. Students from various branches have participated with great enthusiasm in this meet. In addition to distributing prizes to successful participants in sports meet, prizes were also given to the winners of NITRA Golden Jubilee Logo drawing competition, during this event.

I also find it very delightful to state that *ADIEU* - 2024, the annual farewell party of NITRA Technical Campus (NTC) for the class of 2019-23 was also held in this quarter. The event was celebrated with great fun and enthusiasm where the students of 3rd and 4th year participated in large numbers.

While I conclude, I do hope that you will be enjoying reading NITRA News as usual.

Regards,

Dr. Arindam Basu
Director General

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R&D SPECTRUM

Presently, NITRA is working on eight Government sponsored projects:

Government Sponsored Projects - On-going:

- Socio-economic development of SC/ST by providing training, technology and market to convert local resources to industrial products (Sponsored by DST, GoI)
- Development of 3D High Performance Knitted Sports Textiles with Thermo-Physiological Comfort and Impact Protective Properties (Sponsored by NTTM, GoI)
- Development of Crop Cover, mulch, soil protection fabrics and other products using Sunnhemp and Banana Fibre (Sponsored by NTTM, GoI)
- Development of Specialized Firefighting Suit (Sponsored by NTTM, GoI)
- Cellulose based indigenous high Clo value and low density surface modified natural fibre for developing thermal layers of extreme cold weather clothing (Sponsored by NTTM, GoI)
- Development of flame retardant Nylon 66 yarn/fibre indigenously (Sponsored by NTTM, GoI)
- Development of Ceramic and UHMWPE Textile Based Hybrid Polymer Composite Armor jointly with NIT, Jaipur (Sponsored by NTTM, GoI)
- Development of Indigenous State-of-the-art Instruments for Protective Textiles (Sponsoring Agency: NTTM, MoT, Govt. of India)

RESEARCH PAPER PUBLISHED/PRESENTED

S. No.	Title	Author(s)	Publication/Place	Date
1.	Textile Wastewater Treatment through AOPs with Special Focus on Fixed-Bed Approach: A Review	Palak Bansal, A. Kumari & M.S. Parmar	Published in J. Water Chem. Technology Vol - 46, P-292–301	Apr.-Jun. 2024.
2.	Light-Weight Indigenously Developed Firefighter Suit	M. S. Parmar and Nidhi Sisodia	Published in Proceedings of 3rd International Conference on Functional Textiles & Clothing 2023 Springer Proceedings in Materials, Vol - 4, page - 3	Apr.-Jun. 2024.
3.	Assessing the sustainable viability of natural fibre derived from rice straw in textile and fashion industry	Kajal Singh, Kavita Chaudhary & M.S.Parmar	Presented at 6th Int. Conference on Recent Innovations in Research Innovations in Science & Technology (RIST 2024) Thrissur, India,	April 26-27, 2024.
4.	A Comparative Analysis of ChatGPT and Bard AI	Epsit Bhardwaj Krishan Dewan B.K. Sharma	Presented at National Seminar on Realizing Self Reliant India Through Digital Transformation, IPEM, Ghaziabad	April 27, 2024

5.	Need for Internet Security in Social Networks	Amrita Rajvansh, Krishan Dewan N.K. Sharma	Presented at 2nd International Conference on Multidisciplinary and Current Technical Research, MITS, Gwalior (MP)	April 20-21, 2024
6.	Cyberwar as a Battlefield	Nitesh Kumar, Krishan Dewan B.K. Sharma	Presented at 2nd International Conference on Multidisciplinary and Current Technical Research, MITS, Gwalior (MP)	April 20-21, 2024

CONSULTANCY CORNER

Inspection: Coat Combat (5 units), Rain Cap (1 unit), Shirting Angola (1 unit), Vest Thermal (1 unit), Cap Balaclava (2 units), Terry Towel (2 units), Woolen Jersey (2 units), Anti-riot Helmet (1 unit), Full Body Protector (1 unit), Blanket (1 unit), T Shirt (3 units), Barrack Sheet (1 unit), Rib Vest (1 unit), Uniform Cloth 80/20 (1unit), and Thermal Under pant (1 unit)

Process Audit: Process Audit conducted in 1 unit
Manpower Study: Manpower Study conducted in 2 units
Energy Audit: Energy Audit conducted in 1unit
Trouble Shooting for CEPT: Trouble Shooting for CEPT conducted in 2 units

HRD FOCUS

Training Program/Workshop/Seminar Organized by NITRA

- During the reported period NITRA Technical Campus organized a workshop on 'Salesforce' for its TT, CSE and AIML students on 30th April, 2024. The workshop aimed to make the students aware of Salesforce CRM system
- During the reported period NITRA Technical Campus organized an online training program on Staying Relevant in the Job Market in the Age of AI for its CSE and AIML students on 14th June, 2024.
- During the reported period NITRA Technical Campus organized an online training program on Career Guidance Session via Next wave for its CSE and AIML students on 5th June, 2024.

TESTING ZONE

During the period, total 2067 samples were tested in all the labs as par following table:

S. No.	Lab Name	No. of samples tested
1	Physical Quality Evaluation Lab	801
2	Chemical Quality Evaluation Lab including Heat & Flame lab	866
3	Microbiology lab	90
4	Polymer & Technical Textiles Lab	228
5	Eco Lab	62
6	Environment Lab	20

Total No of Fabric Defect Analysis under taken during the period: 0 5

GLIMPSES

NITRA signs MoUs

NITRA Signs MOU with North Eastern Handicrafts & Handlooms Development Corporation Ltd (NEHHDC), under Ministry of Development of North Eastern Region (MDONER) on 2.5.24 for working jointly on mutually agreed textile projects on sustainable fibres for their extraction / regeneration, processing and product development activities as project associate / industry partner.

NITRA signs MOU with Tantu Red River Projects, Guwahati, Assam on 09.04.2024 for Technology Transfer for Extraction of Pineapple Fibre

NITRA becomes proud member of Computer Association of India

NITRA rewards winners of Golden Jubilee year (1974-2024) logo designing competition during Sports Meet 2024

NITRA organized Golden Jubilee Year Logo Designing Competition for students of its academic wing NTC. The winners of the competition were Aakanksha (2nd year) - 1st Position, Nitesh Kumar (3rd year) - 2nd Position and Abhinav Parihar (1st year)- 3rd Position. The winners were rewarded with cash prize and certificate during the prize distribution ceremony of NTC Sport Meet 2024 on April 12, 2024.

NITRA Observes World Environment Day

NITRA observed World Environment Day on 5th June, 2024. Ms. Annu Kumari, Faculty, NTC conducted a special technical session on how to reduce environment pollution for the students. Besides, a Poster Making Competition was organized. Dr. Arindam Basu, along with other officials and students of the institute planted saplings in NTC Campus.

NITRA Observes International Yoga Day

NITRA and NTC observed International Yoga Day at its campus in Ghaziabad. Yoga instructors Ms. Kanika Negi & Mr. Prateek Wadhwa deliberated on "Importance of Yog in Routine Life." Ms. Kanika Negi gave live demonstrations of various Mudra, Asanaa and Pranayama. Faculty members and students of NITRA Technical Campus have actively taken part in this yoga-session.

NITRA Technical Campus Organises Blood Donation Camp

NITRA Technical Campus (NTC), in association with Ghaziabad Blood Centre, organized a Blood Donation Camp on 4th May, 2024 at NTC Campus.. The event is organized in view of imbibing a sense of social responsibilities amongst NTC students. Students and faculty members volunteered to donate blood. Dr. Arindam Basu, DG, NITRA & Director, NTC with senior faculty members distributed certificate, blood bank card and memento to the donors.

Placement Activities (B. Tech) at NITRA Technical Campus

S. No.	Recruiting Company	Branch	Student's Name
1.	SMPP, Delhi	TT	Harshita Srivastava and Arin Tyagi
2.	Khosla Profil, Mumbai	TT	Krishna Kumar Yadav, Himanshu Pal and Sachin Kumar Morya
3.	Q Spider/J Spider (Unit of Test Yantra Software Solutions (I) Pvt. Ltd.	CSE	Niharika Kumari and Tripti
6.	eSec Forte	CSE	Sakshi Choudhary
	Technologies Pvt. Ltd		
7.	NetWings IT Solutions	CSE	Sachin Chaurasia and Mansi Singh
8.	Global logic	CSE	Ambuj Lath

Placement Activities of Short- term Program Students

S. No.	Recruiting Company	Course	Student's Name
1.	RMX Joss	FMM	Anshika Sharma, Kanishka Sharma, Kushagra, Shivam Tomar, Shashi Ranjan
		ADQC	Anant Gupta, Anant Tyagi, Bittu Kumar, Harsh Tyagi, Sachin, Pawan Kumar, Saloni, Aakash Sharma
2.	Radiaant Expovision Ltd	ADQC	Abdul Mugees, Aman, Karan Singh, Rohit Kumar, Sagar Nirwan
3.	Paramount Exports	FMM	Ashwini Sharma
		ADQC	Mihir Sharma, Yuvraj Singh, Krishna
6.	Shahi Exports, Noida	APIE	Adarsh Kumar Mishra, Prateek Bhoje
		ADQC	Saurabh Gupta
7.	Sahu Exports	FMM	Sahil
		ADQC	Pravendra Solanki
8.	International Sourcing Company	FMM	Pawan, Wasim
9	Donovan Apparels Pvt. Ltd	ADQC	Monika Tyagi, Shruti Tyagi, Versha, Savita, Nancy Sharma
10	Tandi , Noida	FMM	Sachin Bisht
11	Timmony India LLP	FMM	Gaurav Chaudhary, Mohd. Asif
		ADQC	Mohd. Siraj
12	Syadwad Impex Pvt. ltd	FMM	Deepak Upadhyay, Ansh Kaushik
13	3M Exim Pvt. Ltd	FMM	Khusboo Pal
14	Kapoor Industries Pvt. Ltd	FMM	Prince
15	Tulip Elastics Pvt. Ltd	FMM	Pooja Khatana

A case study on Water, Chemical and Energy Consumption analysis in textile wet processing industry

A study has been commenced with an objective of reducing water & chemicals consumption in textile processing industry.

Panipat textile clusters are majorly having dyeing & printing units and dominated by home furnishing. The industries are manufacturing home furnishing products such as bed sheets, durree, curtains and blankets. This cluster bears the environmental burden due to extensive resource uses of water, energy, and chemicals, followed by the generation of waste. A face-to-face in-depth questionnaire-based survey was conducted in 19 textile processing industries, wherein a case study of one industry is described for reference.

In the investigated industry (Code PT-011), on an average, 40 liters of water, 129 g of chemicals, and 1.2 grams of agro-fuel are consumed to process 1 kg of textile materials. The industry produces two main types of products, i.e., cotton fabrics, which accounts for approximately 70% of their output, and polyester fabrics, which makes up the remaining 30%. The facility is equipped with various wet processing machinery, including soft flow dyeing and Jigger dyeing machines. The industry has a setup of 100 KL ETP to treat the effluent.

The investigated industry currently processes cotton material in their bleaching process using sodium hydroxide and hydrogen peroxide in two separate steps, each in a different bath of the jigger machine. First, the material is treated with sodium hydroxide in an alkaline medium, and then it is subjected to hydrogen peroxide

treatment in an acidic medium after draining the first bath. The optimal pH for effective hydrogen peroxide bleaching should be between 10 and 10.5; however, in this case, the bleaching is achieved under acidic conditions. As a result, the whiteness of the material is not fully achieved, leading to increased chemical consumption.

NITRA proposed to streamline the bleaching process for the jigger dyeing machine by integrating the two separate stages into a single bath. In this revised method, sodium hydroxide and hydrogen peroxide are combined in one bath, with the pH carefully maintained between 10 and 10.5. This adjustment aims to optimize the generation of per hydroxyl ions, which are the primary active agents in the bleaching process. By maintaining an alkaline pH, the process enhances the efficiency of the hydrogen peroxide while minimizing chemical waste and reducing overall processing time. This approach not only simplifies the bleaching procedure but also potentially improves the consistency of the bleaching results and lowers operational costs. Additionally, it leads to a reduction in the environmental impact by decreasing the volume of wastewater and chemical discharge.
This optimization not only reduces chemical consumption but also lowers pollution levels, decreases water and energy usage, cuts fuel consumption, and minimizes greenhouse gas emissions, leading to a more sustainable and efficient processing approach. The protentional savings on jigger dyeing machine are described below table:

Impact	Conventional Process	NITRA Modified Process	% Savings
Water Consumption (ltr/Kg)	18150	15730	13.33
Chemical Consumption (Kg/batch)	87.2	74.2	14.91
Energy Consumption (Kcal/kg)	605000	484000	20
Agro Fuel Consumption (Kg/batch	189	151	20.11
Electricity Consumption (Kw/batch)	2.39	2.06	13.81
CO2 emission generation (Kg/batch)	267	214	19.85
Time required (Minutes/batch)	3536	3128	11.54

This study could serve as a baseline for the industry and technologists to evaluate water, chemical, and energy consumption more comprehensively, as well as assess the environmental impacts associated with water, wastewater, and chemicals used in textile

production. It can facilitate the development of more sustainable and environmentally friendly processing practices and technologies. Furthermore, the insights gained could help identify opportunities for reducing resource use, minimizing waste, and improving overall environmental performance in the textile sector.

A Golden Jubilee Booklet Series on Technical Textiles!!

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