



Windows

An Annual Newsletter of
Narasinha Dutt College

NDC

Volume 4, December 2025

2024-2025 session marked the centenary year of Narasinha Dutt College. The year long celebrations commenced with a "Prabhat Pheri" and "Padyatra" in July 2024 and concluded with the launch of "Prabaha - Centenary Volume" and felicitation of staff members with a centenary memento in 2025. In between there were cultural programs seminars, launch of commemorative First Day Cover from India Post. At the beginning of 2025, the Scholarship Subcommittee awarded stipends, certificates and medals to our student achievers, after a gap of six years, owing to COVID and it's aftermath. The college went through its traditional share of activities as usual, with retirements, inductions, academic and cultural activities, students' competitions, sports and the like. Newsletter 2025 - Windows NDC - is a witness to and record of all such activities and achievements.

Principal's Message

The 2025 calendar year has been a landmark chapter in our pursuit of excellence. From integrating new digital literacies to expanding our extracurricular horizons, our students continue to prove that they are ready to lead in an ever-changing world.

This edition of our newsletter, Windows, offers a glimpse into the academic pursuits, projects and creative problem-solving happening at every curriculum level. We aren't just teaching facts; we are nurturing the critical thinking and empathy required for the future.

As we look toward the new year, our commitment remains the same: to provide a safe, rigorous, and inspiring environment for every learner. Thank you for being an integral part of our journey. Let's carry this momentum into 2026.



Dr. Soma Bandyopadhyay
Principal



Spandan

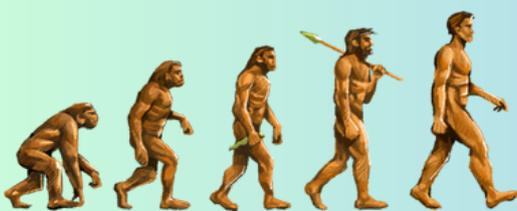
Anthropology Departmental Publication (Songhita)



Two students of department of Anthropology - Soumyapriya Senapati And Anweshan Dutta (alumni) of Dept of Anthropology performed in choreography and Sananda Karmakar was involved in background score of the documentary. The documentary was screened in the kolkata international film festival 2025.

YouTube Link:

<https://youtu.be/kpOh-yUQXxk?si=iN1Hxbsdb7RKW0-m>



Seminar attended by Faculties of Anthropology Department at Vivekananda College for Women (MoU)



At Ethnography museum of Dept. of Anthropology, Calcutta University



Museum visit of Sem V major students at Indian Museum



Teachers' day celebration at Anthropology Department



**Internship Workshop on
Drama and Recitation,
Dept. of Bengali, May,2025**



**Rabindra Jayanti, Dept. of Bengali,
May,2025 Departmental wall Magazine,
Bengali Dept.
'SROTOSWINI',September 2025**



**Visit to garden house of
Abanindranath Tagore**



**A summer Internship was organized by the department of Botany on
the topic- "Sustainable Honey-Farming: From Nectar to Jar" from 9th
June 2025-23rd June 2025 where 36 students from five different
colleges participated.**



Students of the Department of Botany participated in a quiz competition organized by Botanical Survey of India on the occasion of Earth day 2025 and stood 3rd position.



Students of Semester VI Published a scientific article in the journal NDC-EDIOS and they were felicitated on 22nd September 2025



One Day Scientific Social Responsibility Outreach Event on “Plant-Nanoplastic Interaction: Scientific Insights Into Environmental Risks and Solutions” held on 9th December 2025.

Speaker- Dr. Ayan Adhikari, FLS (London) Principal Investigator (SERB-NPDF)



Students Awareness Programme on 9.09.2025.

Student's Seminar on 9.07.2025.



Howrah, West Bengal, India
 129, Bellilious Rd, Tikiapara, Howrah, West Bengal 71101, India
 Lat 22.592581° Long 88.328433°
 09/09/2025 04:35 PM GMT +05:30



Howrah, West Bengal, India
 74/3, Bellilious Rd, Kadam Tala, Howrah, West Bengal 71101, India
 Lat 22.592231° Long 88.328864°
 09/09/2025 04:35 PM GMT +05:30

Student Orientation Programme on 9.09.2025.



A Seminar was arranged by Dept. of Commerce with "AVISION" on 29.7.2025.



An Inter-College Debate Competition was arranged by "Ei Somoy" Newspaper on 08.09.2025.



Prof. Bhim Rajak (HOD) & Prof. Avijit Kanrar at ICSI Felicitation Programme on 13.09.2025.



STUDENT'S SEMINAR ON 8.07.2025





Detection of Schizophrenia from EEG Signal – An Extended Deep Learning Framework Using 1D-CNN and CNN-LSTM on Small Dataset

Author: Angshuman Sarkar¹, Shambo Saurav Mallik²

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Abstract

Schizophrenia (SZ) is a complex neuropsychiatric disorder that significantly impairs cognition, behavior, and perception. Electroencephalography (EEG) provides a non-invasive, cost-effective means to capture brain activity, but due to the multichannel, high-dimensional nature of EEG data, manual diagnosis remains challenging. In this extended study, we investigate the performance of deep learning (DL) frameworks, specifically 1D Convolutional Neural Networks (1D-CNN) and hybrid CNN-LSTM architectures, for automated detection of SZ using a small EEG dataset comprising 14 SZ patients and 14 healthy controls. We design two variants of 1D-CNN and CNN-LSTM, analyze their performance using extensive cross-validation, and introduce additional experiments such as ablation studies and statistical significance testing. Evaluation metrics including accuracy, precision, recall, specificity, F1-score, and AUC-ROC demonstrate that the proposed CNN-LSTM models outperform other architectures, achieving up to 99.35% accuracy. Our findings confirm the potential of hybrid deep learning models in robust SZ identification, even with limited data, paving the way for scalable and generalizable EEG-based diagnostic tools.

Introduction

Schizophrenia (SZ) is a chronic and severe mental disorder characterized by cognitive fragmentation, hallucinations, and emotional dysregulation. Despite its low prevalence, approximately 1% globally, SZ remains one of the most disabling psychiatric conditions. It typically manifests in late adolescence or early adulthood and presents varying symptoms and severity among individuals. The early detection of SZ is essential to improve treatment response and long-term outcomes.

EEG is a non-invasive, temporally precise tool for recording the brain's electrical activity. It is especially valuable in psychiatric diagnosis due to its affordability and accessibility compared to other neuroimaging techniques such as MRI or PET. EEG abnormalities in SZ patients include decreased alpha activity, increased theta and delta waves, and disruptions in functional connectivity. However, manual EEG interpretation is time-consuming and subject to inter-rater variability.

Recent advances in Artificial Intelligence (AI), particularly Deep Learning (DL), have enabled end-to-end modeling of EEG data. Traditional Machine Learning (ML) pipelines required meticulous hand-crafted feature extraction, but DL architectures such as CNNs and RNNs can autonomously learn complex spatiotemporal patterns. CNNs excel at capturing spatial dependencies across EEG channels, while LSTMs model temporal dependencies. Their integration into CNN-LSTM hybrids combines both

Paper Published in NDC E-BIOS by Prof. Angshuman Sarkar and Prof. Shambo Saurav Mallik

Sectoral Stock Analysis for Bullish and Bearish Market Conditions Based on Time Series Analysis Approaches

Snehadhanya Dutta¹, Tamoghna Mukherjee²⁽⁰⁰⁰⁰⁻⁰⁰⁰¹⁻⁸⁰⁶⁵⁻³⁸⁵⁰⁾, Moumita Chatterjee³, Sukhendu Kanrar⁴, Narayan C Debnath⁵ and Soumya Sen⁶⁽⁰⁰⁰⁰⁻⁰⁰⁰²⁻⁹¹⁷⁸⁻⁶⁴¹⁰⁾

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Abstract. Share forecasting is always a research challenges due to the continuously evolving conditions that are evolved around the world that could be war between countries, change of government policies, different macro-economic effects etc. These different factors lead to intrinsic volatility, market unpredictability and that cause difficulties to forecast the behavior of market as well as the stock prices. Based on the several factors market goes up that means stock prices increases (which is called bullish market) and when the market goes down that means stock prices decreases, that condition is known as bearish market. Investors who invest in market often prefer some specific sectors such as IT, Banking, Retail etc. In order to reflect this view of investors this research work focuses on the improving the precision and dependability of stock price forecasts under general, bullish, and bearish market conditions. The concept of Fibonacci retracement is used in the analysis which is an important indicator to understand the behavior of stock market. The proposed methodology blends the interpretability of conventional statistical techniques with the versatility of contemporary deep learning by combining these measures with a hybrid collection of models, such as ARIMA, SARIMA, and LSTM. The performances of different models are assessed using several error metrics, including RMSE, MSLE, and MAPE. These help us to provide trend-sensitive forecasting for different market segments.

Keywords: Sectoral Stock Forecasting, Bullish, Bearish, Fibonacci

Paper Published by Dr. Sukhendu Kanrar



Teachers with Passout Batch



Freshers Welcome Programme



Howrah, West Bengal, India

31, Narasingha Dutta Rd, Kadamtala, Bantra,

Ichapur, Howrah, West Bengal 711101, India

Lat 22.587116° Long 88.319839°

24/04/2025 11:08 AM GMT +05:30

Workshop conducted at Tarasundari Balika Bidyalya with NSS

RESEARCH ARTICLE

Cyanide Sensing by 5-Halo-2,2'-Bithiophene-5-Carboxaldehyde Nanomaterials: Effect of Halogenation and Density Functional Theory Studies

Debarajana Bag¹ | Shobhon Akh¹ | Tanmay Datta¹ | Narendra Nath Ghosh¹ | Iora Maiti¹ | Radha Madhab Laha¹ | Suman Kumar Maity¹ | Dilip K. Maiti¹

¹Department of Chemistry, University of Calicut, Kozhikode, India; ²Department of Chemistry, IIT College of Engineering, Kalyani, West Bengal, India; ³Yakubat A. N. M. High School, Malda, West Bengal, India; ⁴Department of Science & Humanities, Manipal Institute of Technology, Bangalore, West Bengal, India; ⁵Department of Chemistry, Narasinha Dutt College, Howrah, India

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Received: 19 September 2025 | Revised: 6 November 2025 | Accepted: 17 November 2025

Keywords: activation energy | chemo-dosimeter | cyanide sensing | DFT calculation | X-ray crystallography

ABSTRACT
The development of efficient strategies for the detection of cyanide ions simply and cost-effectively is significant in contemporary research. Novel design principles for efficient visual and fluorometric sensing methods for cyanide ions using halogenated (Br, I) organic nanomaterials of 2,2'-bithiophene-5-carboxaldehyde was developed, and the effects of the number of halogen substituents on sensing were analyzed. Quantitative analysis of cyanide sensing by 5'-iodo-2,2'-bithiophene-5-carboxaldehyde revealed that the binding constant is $1.38 \times 10^7 \text{ M}^{-1}$ at room temperature. The limit of detection (LOD) and the limit of quantification (LOQ) were determined to be $3.52 \times 10^{-7} \text{ M}$ and $0.17 \times 10^{-6} \text{ M}$, respectively. Additionally, Job's plot revealed 1:1 stoichiometric binding between 5'-iodo-2,2'-bithiophene-5-carboxaldehyde and cyanide ion. Halogen bond and π - π stacking interaction mediated assembly of 5'-iodo-2,2'-bithiophene-5-carboxaldehyde was obtained from single crystal X-ray diffraction studies. Noncovalent interaction-mediated self-assembly of the sensor resulted in spherical nanostructures, as evident from transmission electron microscopy (TEM). Importantly, density functional theory (DFT) studies showed that by increasing the number of halogen substituents (Br, I) on 2,2'-bithiophene-5-carboxaldehyde, the activation energy for the nucleophilic attack of cyanide to the aldehyde moiety decreases, and thereby the cyanide sensing efficiency increases.

1 | Introduction

Tuning the electronic properties of conjugated aromatic systems through chemical modification and thereby modulating their chemical and physical properties for diverse applications are highly advantageous and challenging [1]. For example, different substitutions on conjugated aromatic systems help to improve their power conversion efficiency in organic photovoltaics [2]. In recent years, halogenation on conjugated thiophene moieties has gained major attention owing to the propensity of halogens to impart major changes in electronic properties and simplicity in their installation [3, 4]. For instance, halogenation on the bithiophene moiety embedded in polymer exhibited improved

efficiency in organic solar cells [5, 6]. We have reported that the dihalogenation on the 2,2'-bithiophene-5-carboxaldehydes resulted in diverse applications, including aggregation-induced emission properties and cyanide ion sensing [7]. With the rapid growth in industrialization, where the use of cyanide ions is prevalent, the development of efficient strategies and sensors for cyanide ion detection simply and cost-effectively is highly demanding in contemporary research [8]. Cyanide ion is extremely toxic to mankind and the environment in very minute amounts. Several strategies have been developed recently for cyanide ion sensing [9-16] including chelation to metal [17] and metalligels [18], supramolecular gels [19], and nucleophilic

Debarajana Bag and Shobhon Akh contributed equally to this study.

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1 of 9

Two-component organogel from halogenated peptide: A robust matrix for gel phase colorimetric cyanide sensing

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ARTICLE INFO

Keywords:
Two-component gel
Cyanide sensing
Halogenated peptide
X-ray crystallography

ABSTRACT

Two-component organogel was achieved from dipeptides containing non-proteinogenic α -amino benzoic acid (Paba) and 2-aminoisobutyric acid (Aib). Boc-Paba-Aib-OMe formed weak organogel alone, however, formed stable two-component organogel with Boc-Paba(Aib)-Aib-OH in 1:1 M ratio. FE-SEM revealed microcrystalline structures from Boc-Paba-Aib-OMe, however, mature long entangled nanofibers were obtained from two-component organogel. No other peptide and peptide combinations, from the pool of six peptides, revealed any gelation indicating unique molecular recognition. X-ray crystallography of Boc-Paba-Aib-OMe revealed hydrogen bonded two-dimensional sheet like structure. The two-component gel served as a robust matrix for trapping a chemo-dosimeter, affording simple colorimetric cyanide sensing in gel state.

1. Introduction

Gels are soft, semi-solid materials which contain both solid and liquid components, where the solid components i.e. the gelators form a network of aggregates which immobilize the liquid components by preventing their flow [1]. Organic liquids, upon being immobilized in the gelator networks afford organogels [2]. Organogels exhibit improved mechanical, thermal and environmental stability which make them preferred candidates for wide range of applications in diverse fields including anti-freezing [3], anti-biofouling [4], reagent delivery in organic synthesis [5], drug delivery [6], cosmetics industry [7], wax coating removal [8], food processing [9], sensing [10], droplet manipulation [11] etc. Two-component gels impart additional complexity as well as advantages such as tunability of the properties of the gel by tuning the ratios of the components [12]. In general, one or both the components of a two-component gel exhibit strong gelation properties individually [13]. Two gelators independently can self-assemble to form nano/micro structures resulting strong gelation [14]. On the other hand, the self-assembled nano/micro structures from individual gelators can interact with each other to form two-component gels [15]. Thus, it is important to understand the inherent complexity of the gelation mechanisms to develop novel strategies for the two or multicomponent systems [15]. Protected amino acids and peptides have been explored widely as low molecular weight building blocks for fabrication of

efficient organogels for important applications [16-22]. Very recently, short peptide molecules containing halogenated phenylalanine and tyrosine moieties had displayed improved self-assembly propensities leading to strong gelation properties compared to the native peptides [23-28]. The halogenation played important role to the self-assembly processes including gelation, however, the exact causes were not clear in most of the cases.

On the other hand, rational design of low molecular weight organogelators for visual sensing of analytes, devoid of the use of sophisticated instruments, is of great importance [29-31]. Simple, selective and colorimetric sensing of cyanide ion in trace amount has gain major research interest owing to the threatening toxicity of cyanide ion as well as its increased release from industry and mining to the environment [32]. A wide range of techniques and sensors had been developed for the detection of cyanide ion. We have reported dihalogenated bithiophene aldehyde moieties as efficient and selective chemo-dosimeters for sensing of cyanide ion in acetonitrile-water (1:1) solution [33]. Visual detection of cyanide ion in gel state including metallo-gels has also been developed in recent years [34]. The detection methods involve the sol-gel transformations in either way, changes in color, absorption and emission spectra [32,35]. In most of the cases the gelator molecules themselves or the metal ions in the metallo-gels interact with cyanide ion and thereby produce the response leading to the sensing. The gel state cyanide sensing has several inherent advantages including

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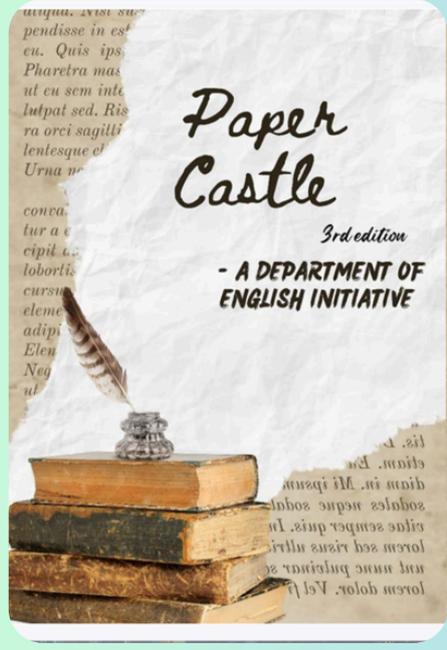
Available online 21 December 2025

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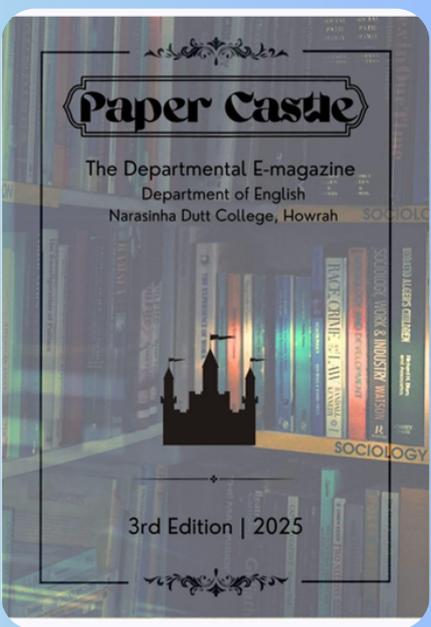


Publication by Dr. Suman Kr. Maity
Dr. Indranil Bhattacharyya participated and chaired a session in the national seminar on “Current Perspective in Chemical Research 2025”, organized by Department of Chemistry, St. Xavier’s College, Kolkata, from 31.10.2025 to 31.10.2025.

Dr. Indranil Bhattacharyya participated and chaired a session in the International Seminar on “Frontiers of Chemistry: Redefining Molecules, Redesigning the Future (FCRMRF-2025)” organized by the Department of Chemistry, New Alipore College, in association with IQAC and the New Alipore College Students’ Alumni Association on 10.12.2025.



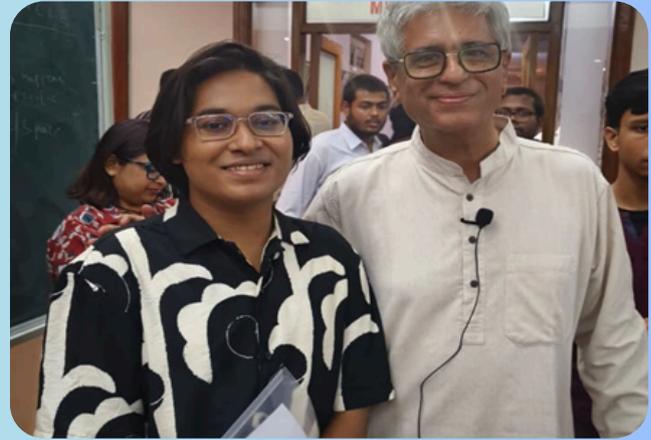
Paper Castle 3rd Edition, e-magazine of the Dept of English, PG and UG was published in Aug 2025





**Osmita Mitra , PG Sem 3,
Department of English, paper
presentation on Austen at Loreto
college**

**Srinjoy Bhowmik, PG sem 3,
Department of English, participated in a
workshop with Mahesh Dattani at
Narendrapur RKM**



Department of History

On the occasion of observation of Library Day Online “Poster Making Competition” jointly organized by Central Library and Universal Briefing on December 20,2025.

On the occasion of observation of International Yoga Day, 2025 an “Online Yoga Competition” jointly organized by Central Library and Games and Sports Subcommittee in collaboration with IQAC during June 21-23, 2025



Reunion, Department of Mathematics



STATISTICS, OPTIMIZATION AND INFORMATION COMPUTING
Stat., Optim. Inf. Comput., Vol. 15, March 2025, pp 1834–1850.
Published online in International Academic Press (www.IAPress.org)

Impact of Fear, Allee Effects, and Harvesting on a Predator-Prey Delay Model with a Modified Beddington–DeAngelis Functional Response

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²Department of Mathematics and Statistics, Aliah University, India

Abstract This paper studies the dynamics of a delayed predator-prey model with a modified Beddington-DeAngelis response function influenced by fear factors, Allee effects, and harvesting on the predator population. This paper analyzes the influence of parameters, namely fear factors (ω), Allee effects (α), and delay time (τ), on the stability of the model's equilibrium point. First, an analysis of the existence of the model's equilibrium point is carried out, then an analysis of the stability and the influence of changes in the model's parameter values and delay time that can affect the stability of the model's equilibrium point is carried out. The analysis indicates that the larger the parameters ω , α , and τ , the more unstable the coexistence equilibrium point tends to be. Several numerical simulation results are used to validate the analytical results obtained.

Keywords Predator-prey model, Beddington-DeAngelis, Fear effects, Allee effect, Harvesting, Stability

AMS 2010 subject classifications 34C15, 34C23, 37G15, 37N25

DOI: 10.19139/soic-2310-5070-2574

1. Introduction

The study of predator-prey dynamics has become one of the main research topics in ecosystems, because it can provide a deep understanding of the influence of various ecological factors on ecosystem sustainability. In the ecosystem, the interaction between predators and prey is often influenced by external factors that can change the behavior of the predator-prey system dynamics as well as its stability and the sustainability of the ecosystem as a whole. The predator-prey model describes the dynamic interaction between two species with a pattern of relationships that influence each other and are often influenced by several factors, namely the fear experienced by the prey, the impact of the Allee effect on low populations, and hunting by the predator on the prey itself. To handle more realistic interactions in conditions of varying population densities, one of the functions that describes predator-prey interactions is the Beddington-DeAngelis function. This function describes the dynamics of predator-prey interactions in ecosystems that consider population density. Research on the combined effects of these factors is very important to understand how these elements interact with each other and affect the stability of the ecosystem in the long term.

Several researchers have studied these factors and the combination of these factors in the predator-prey model. The fear effect, which reflects changes in prey behavior due to threats from predators, has been the focus of various studies. The importance of fear factors in prey populations has received special attention in several studies, where fear of predators can change prey behavior and significantly affect ecosystem structure. [1], [2] and [3] showed

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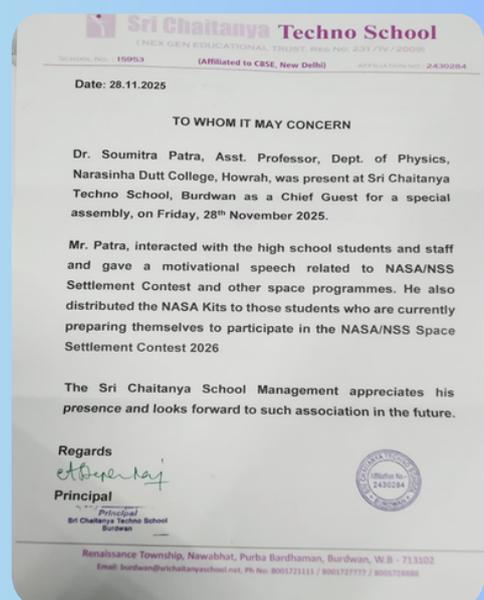
**Publication by Prof. Hasanur Mollah,
Department of Mathematics**

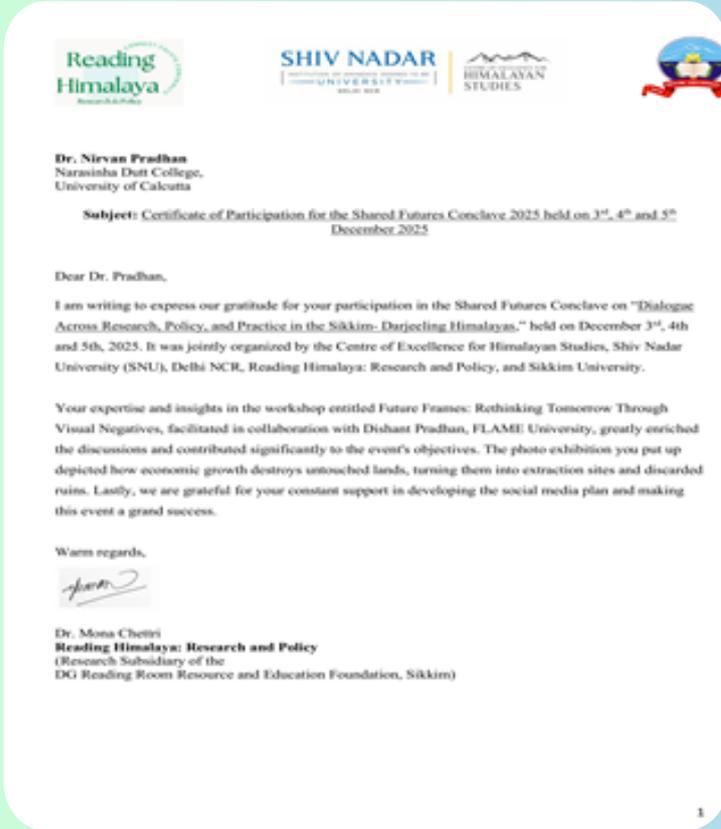


A study tour was organised by the department on 03.12.2025 to Raja Ram Mohan Roy Museum and Kolkata Police Museum. Students of Philosophy Major (1st, 3rd, and 5th Semester) participated in the study-tour, along with the Departmental Teachers.



The Department of Philosophy organised a special lecture on “Care Ethics” in observance of World Philosophy Day on 28 November 2025. Dr. Dalia Roy, Associate Professor, Department of Philosophy, Shibpur Dinobandhoo Institution (college) was the speaker.





Dr. Nirvan Pradhan of Political Science Department conducted a workshop "Speculative Futures" in the Shared Futures Conclave on "Dialogue Across Research, Policy, and Practice in the Sikkim- Darjeeling Himalayas", jointly organized by the Centre of Excellence for Himalayan Studies, Shiv Nadar University (SNU), Delhi NCR, Reading Himalaya: Research and Policy, and Sikkim University. He also put up a photo exhibition titled "Shared Futures in Capitalist Ruins" depicting how economic growth destroys untouched lands, turning them into extraction sites and discarded ruins.

From Political Science Department Simran Singh Rathor participated and won the Viksit Bharat Competition



Summer Internship by the students of Sanskrit Department from 16.05.2025 to 02.06.2025 at Don Bosco Ashalayam





Student Seminar by Department of Sanskrit on 11.12.2025



Departmental wall magazine, Department of Urdu



Wall magazine put up, Zoology Department (Topic: Human Animal Conflict)





Kolkata, West Bengal, India
 Nh 117, Alipur Zoological Garden, Alipore, Kolkata, West Bengal 700027, India
 Lat 22.536308° Long 88.332727°
 03/06/2025 10:12 AM GMT +05:30

Sem 6 Animal Behaviour Study at Alipore Zoo, Zoology Department



Howrah, West Bengal, India
 8/2/1/1, Narasingha Dutta Rd, Kadamtala, Kadam Tala, Howrah, West Bengal 711101, India
 Lat 22.591747° Long 88.320302°
 26/08/2025 10:40 AM GMT +05:30

Sem 2, Zoology Department, Field Visit to Fish Market



Buxa Forest, West Bengal, India
 Jg8h+r86 Buxa Tiger Reserve, Buxa Forest, West Bengal 735226, India
 Lat 26.6209° Long 89.530715°
 10/12/25 04:47 PM GMT +05:30

Sem 6 Animal Behaviour Study at Alipore Zoo, Zoology Department



Excursion at Gorumara National Park, Buxa Tiger Reserve and Jaldapara wildlife Sanctuary with Sem 3 and Sem 5 students, Zoology Department

First Day Cover





Seminar on Beat Plastics: For A Sustainable Blue Economy



Centenary Auditorium



NSS Activities

