



# **Research Cell Report**

**2019 - 2024**

**MAHESHTALA COLLEGE  
MAHESHTALA COLLEGE, BUDGE  
BUDGE TRUNK ROAD,  
MAHESHTALA,  
KOLKATA - 700139**

[www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)



# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139

E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com)/ principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## Research Cell

A research cell is formed with the following members of teaching staff, Maheshtala College:

### **Committee:**

- (1) Chairman: Dr. Rumpa Das, Principal, Maheshtala College
- (2) Convener: Dr. Payel Rakshit

### **Members:**

1. Prof. Sonatan Soren
2. Prof. Mohammad Johaed
3. Sri Sasanka Sekhar Maity
4. Sri Reeswav Chatterjee
5. Sri Kishore Roy Sarkar
6. Smt. Suchismita Neogi
7. Sri Juyel Ali



# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com)/ principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

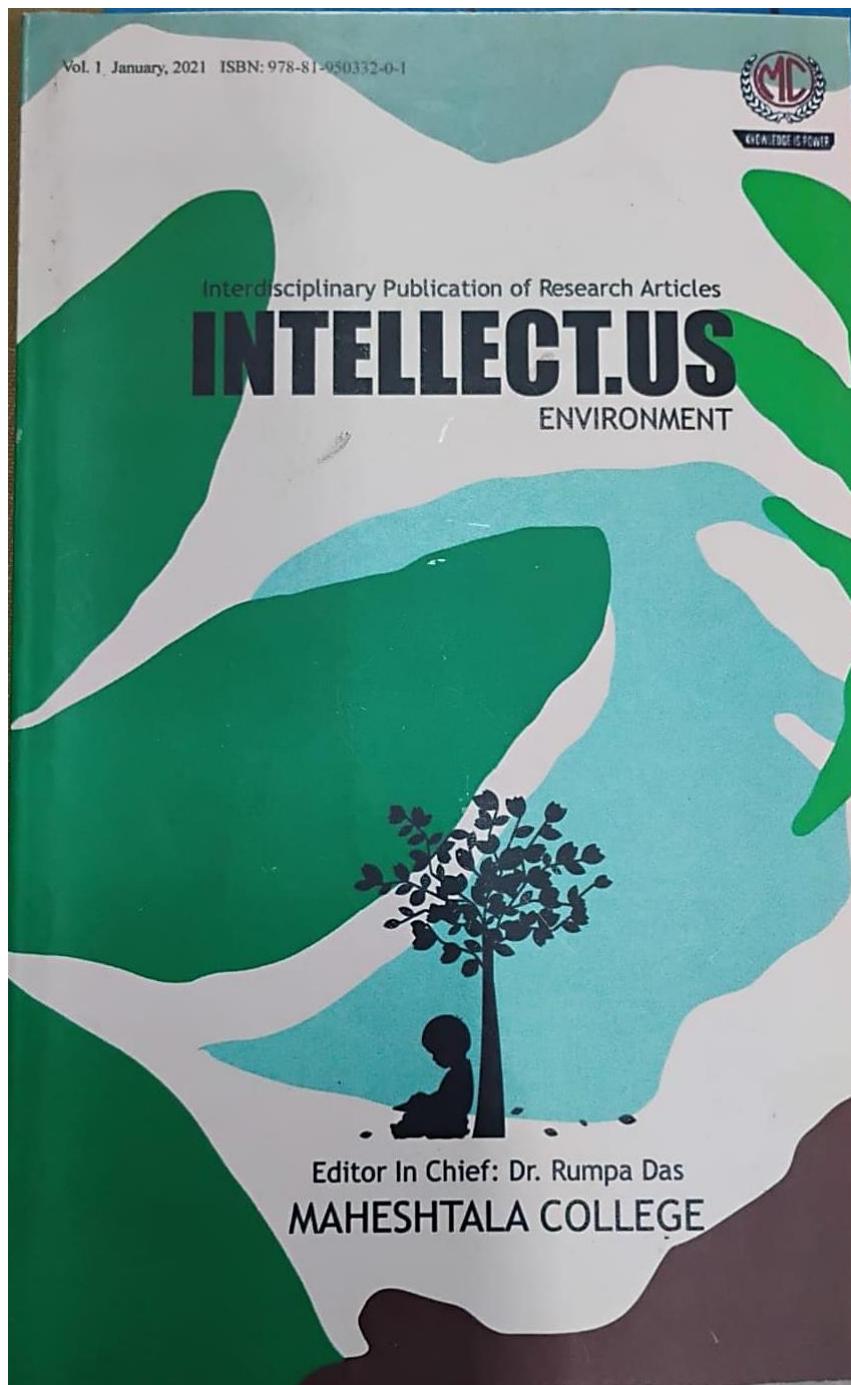
## Summary of Research & Publication (2019-2024)

- |     |   |   |
|-----|---|---|
| 1.  | Research Forum DHIMAHİ-                   | 17  |
| 2.  | Research Publication (intellect.us)-      | 02  |
| 3.  | College Journal (ANWESHAN)-               | 04  |
| 4.  | ICSSR Sponsored Major Research-           | 01  |
| 5.  | NAAC, ICPR Sponsored-                     | 02  |
| 6.  | Students' Seminar-                        | 227   |
| 7.  | Teachers' Presentation-                   | 373   |
| 8.  | Teachers' Publications (In UGC journals)- | 17  |
| 9.  | Book Publication-                         | (Book chapters: 48, Book: 05 (2 books as per NEP & CBCS syllabus) |
| 10. | Projects By Students-                     | 300   |
| 11. | Internships by students-                  | 146   |
| 12. | Webzines-                                 | 05  |
| 13. | Major research projects-                  | 01  |
| 14. | Awards received by teachers:              | 03  |
- 
- Asian Education Award 2020 (Dr. Rumpa Das, Principal)
  - Durga Shiksha Samman 2024 (Dr. Rumpa Das, Principal)
  - Junior fellowship in the field of literature, Center for Cultural Resource and Training (Dr. Monami Basu, Dept. of Bengali, Maheshtala College)

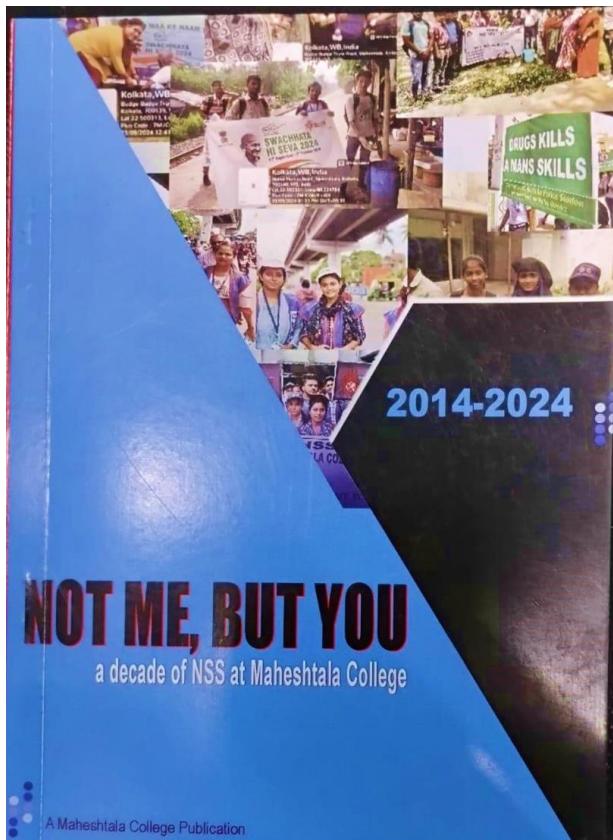
## Interdisciplinary Research article of Maheshtala College

**Intellect.US** is an interdisciplinary, peer-reviewed publication featuring research articles from scholars and educators across various disciplines. Published by Maheshtala College, the journal provides a platform for critical inquiry and academic exploration on a chosen theme for each volume. The first volume, released in January 2021, focused on "Environment," while the second volume delves into the theme of "Gender."

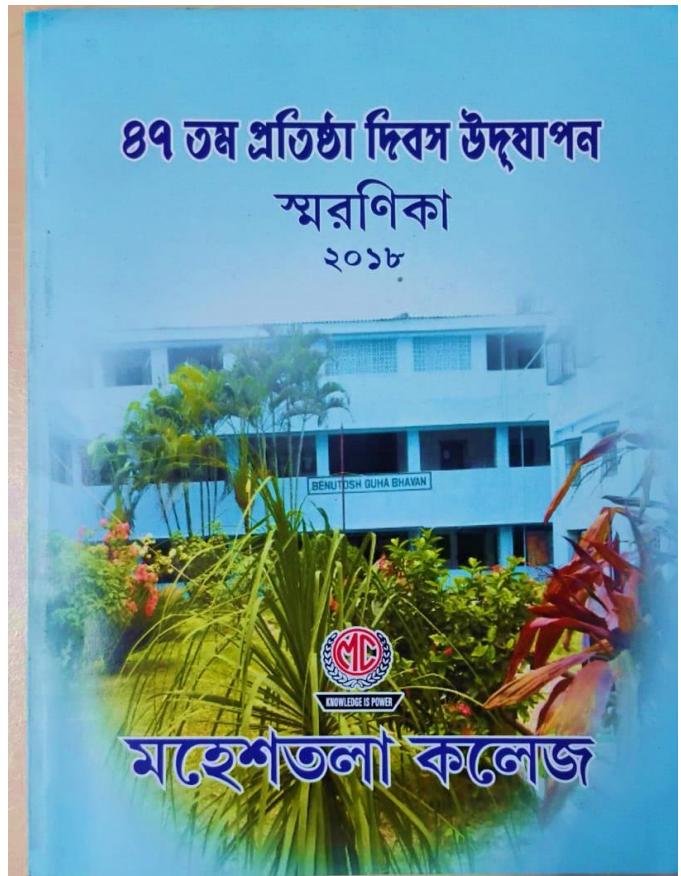
The journal serves as a space for intellectual engagement, encouraging fresh insights and discussions that challenge traditional boundaries. Through this initiative, Intellect.US continues to uphold academic excellence and contribute to contemporary debates in the humanities and social sciences.



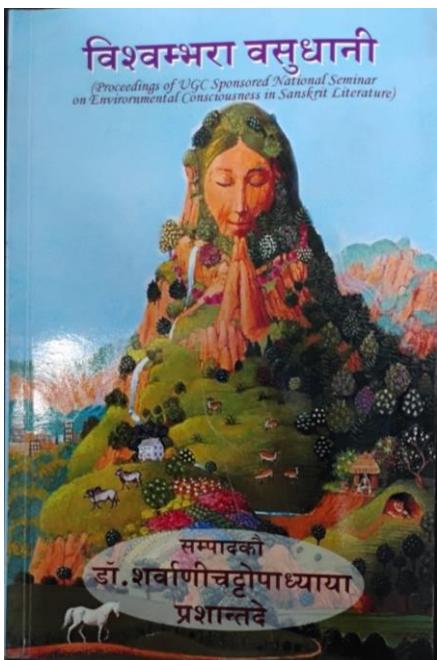
## 10 years of NSS



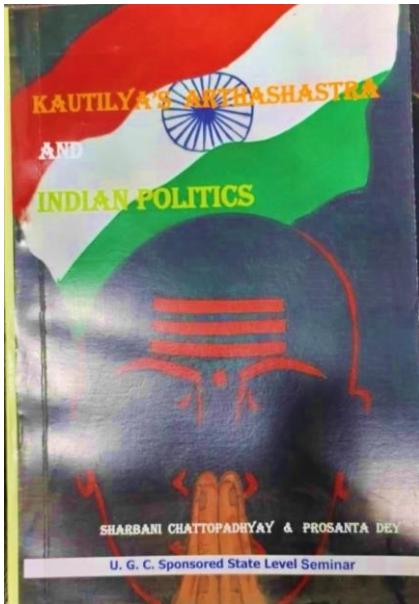
## *47<sup>th</sup> Foundation Day Celebration*



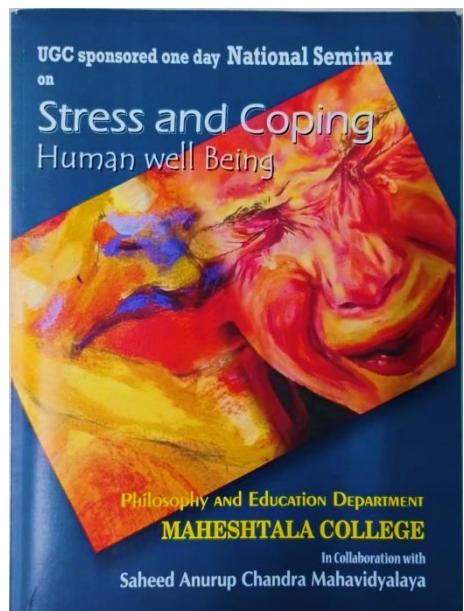
## Departmental Publications



*Department of Sanskrit*

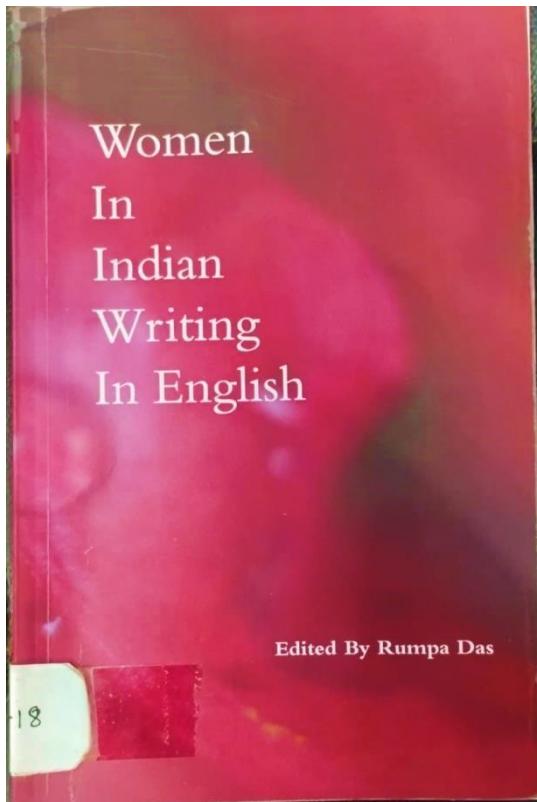
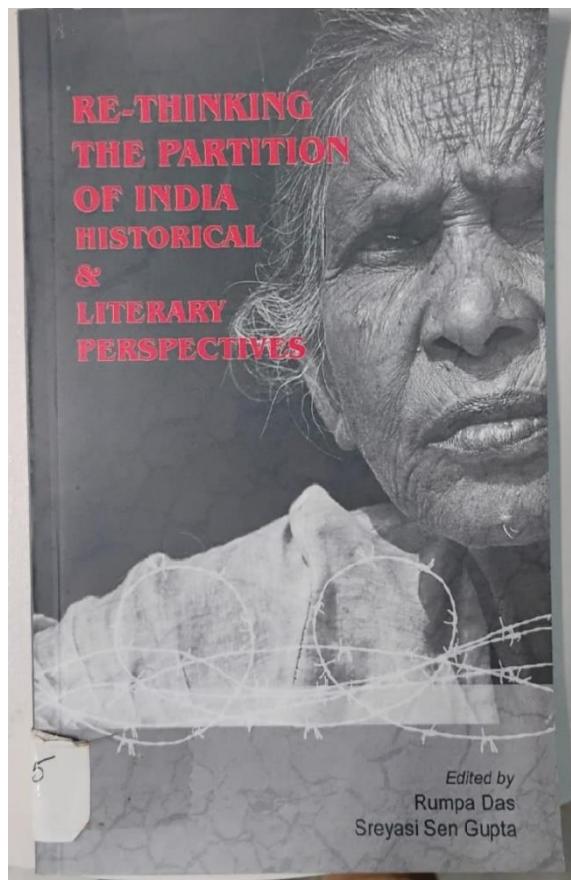
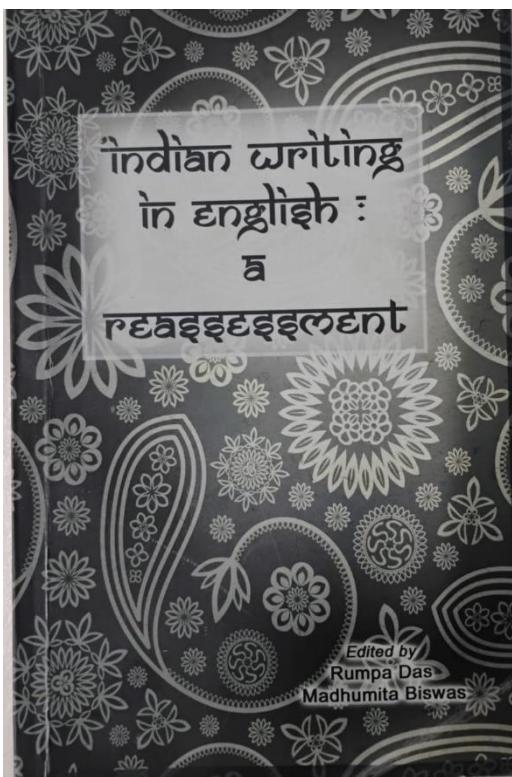


*Department of Sanskrit*

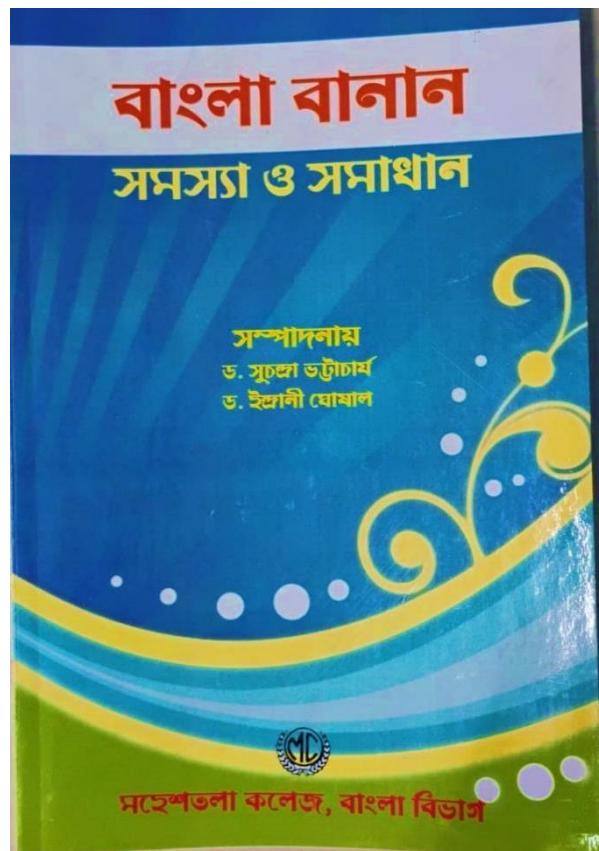
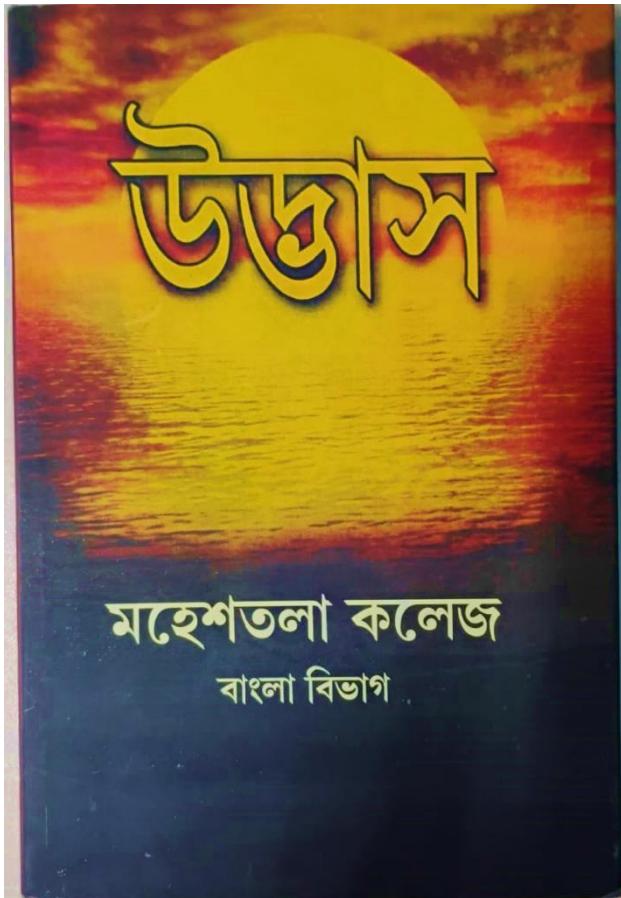


*Department of philosophy & Education*

## Department of English



*Department of Bengali*



## Department of Geography

# Empowering knowledge through Research & Major Projects

**Changing Land Use pattern and its impact on socio economic environment of Alakananda River Basin, Uttarakhand, India (F.No. 02/164/2021-22/ICSSR/MJ/RP**

### Major Research Project,

**ICSSR (Indian Council of Social Science Research), Ministry of Education (Govt. of India)**  
**JNU Institutional Area, Aruna Asaf Ali Marg, New Delhi – 110067**

**Photographic Evidences of Field Work , Badrinath , 2023**



GPS Map Camera

Joshimath, Uttarakhand, India  
Way to Vishnu Prayag, VishnuPrayag, Joshimath, Uttarakhand 246443, India  
Lat 30.562653°  
Long 79.575522°  
17/02/22 02:07 PM GMT +05:30

GPS Map Camera

Ghuret, Uttarakhand, India  
4994-V-BH, Ghuret, Uttarakhand 249192, India  
Lat 30.142306°  
Long 78.995353°  
10/02/22 02:38 PM GMT +05:30

**Data Collection & Field Survey, 2023**



GPS Map Camera

Wadia Institute of Himalayan Geology, Dehradun  
Dehradun, Uttarakhand, India  
XXXIV-QM2, Forest Research Institute, Indian Military Academy, Dehradun, Uttarakhand 248003, India  
Lat 30.344645°  
Long 77.996607°  
01/01/24 12:07 PM GMT +05:30

GPS Map Camera

Forest Research Institute Library, Dehradun  
Dehradun, Uttarakhand, India  
XXXIV-QM2, Forest Research Institute, Indian Military Academy, Dehradun, Uttarakhand 248003, India  
Lat 30.344645°  
Long 77.996607°  
01/01/24 12:07 PM GMT +05:30

GPS Map Camera

Survey of India, Dehradun  
भारतीय सर्वेक्षण विभाग  
कार्यालय एवं अधिकारी कार्यालय  
Survey of India  
Office and Residential Centre

**PROGRESS REPORT - 1**

*Changing Land Use Pattern and its Impact on Socio Economic Environment of Alakananda River Basin, Uttarakhand, India*

(April 2022 – March 2023)



Project Reference No.: F.No. 02/164/2021-22/ICSSR/MJ/RP

**PROGRESS REPORT - 2**

*Changing Land Use Pattern and its Impact on Socio Economic Environment of Alakananda River Basin, Uttarakhand, India*

(March, 2023 – September, 2023)



Project Reference No.: F.No. 02/164/2021-22/ICSSR/MJ/RP

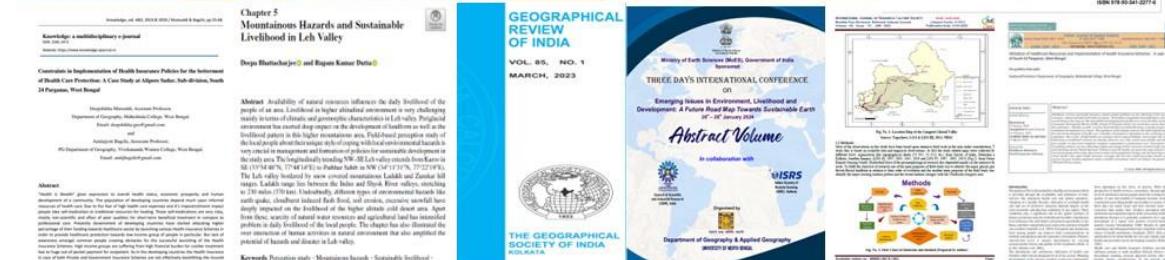
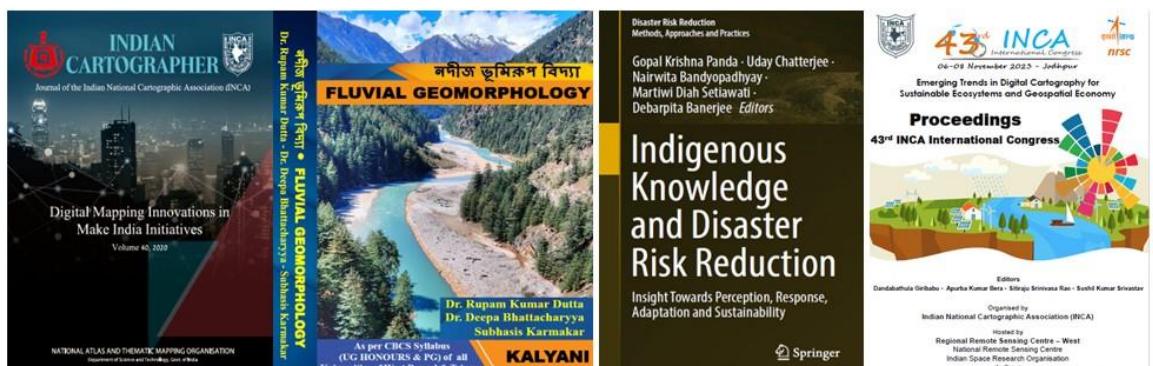
Major Research Project,  
ICSSR (Indian Council of Social Science Research),  
Ministry of Education (Govt. of India)  
JNU Institutional Area, Aruna Asaf Ali Marg,  
New Delhi – 110067

By  
**Dr. Deepa Bhattacharjee**  
Project Director, Major Research Project,  
ICSSR (Indian Council of Social Science Research)  
Department of Geography, Maheshtala College, Kolkata – 700141

Honouring innovative research & Acknowledging research impact



# **Publication of the Faculties**





**MAHESHTALA COLLEGE**  
**BUDGE BUDGE TRUNK ROAD**  
**KOLKATA-700141**  
**Mobile No.: 7439501363 /6289482452**  
**Website: <https://www.maheshtalacollege.ac.in>**  
**Email: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com)**

## DHIMAHİ: Maheshtala College Inter disciplinary Research Forum

### **About the Forum:**

Dhimahi is an Online International Interdisciplinary Research Forum where every fortnight we meet on Saturdays at 8pm for about an hour and half. We usually volunteer to speak on eclectic issues of academic relevance. This forum is solely for academic research and deliberation and we stay away from sensitive issues - political, communal and religious. Anyone can be a member and there are no charges. Certificate may be provided to a Resource Person after her/his lecture but we do not provide participation certificate. Participation is free and we are planning to hold an ANNUAL MEET (on site) sometime later this year.

**Objectives of the Forum:** The objectives of the College research forum are to foster a culture of research and innovation among students, faculty, and researchers. It aims to provide a platform for sharing and discussing research findings, promoting interdisciplinary collaboration, and enhancing research skills. The forum also seeks to encourage critical thinking, knowledge dissemination, and the development of solutions to real-world problems through research endeavours.

### **Obstacles faced if any and strategies adopted to overcome them:**

The DHIMAHİ may encounter various obstacles that can hinder its effectiveness. One of the primary challenges is maintaining active participation and engagement from participants, as online platforms can sometimes lack the personal interaction and motivation found in face-to-face settings. To overcome this, the forum can implement strategies such as hosting interactive webinars, virtual panel discussions, and Q&A sessions to encourage active involvement. Providing incentives like certificates or recognition for active participation can also help generate interest and motivation among participants.

Another obstacle is the potential for technical difficulties or connectivity issues during online sessions. To address this, the forum can conduct trial runs and offer technical support to participants beforehand. Utilizing reliable online platforms and ensuring a stable internet connection are essential. Moreover, providing clear instructions and guidelines for accessing and navigating the online forum can help participants overcome any technical challenges they may encounter.

Ensuring inclusivity and accessibility is another important consideration. Some participants may face limitations in terms of technology access, language barriers, or disabilities. The forum can mitigate these obstacles by offering alternative formats such as transcripts, subtitles, or sign language interpretation for participants with hearing or visual impairments. Additionally, providing multilingual support or translation services can facilitate participation from a diverse range of individuals.

Lastly, maintaining data security and privacy is crucial in an online research forum. Strategies like using secure and encrypted communication channels, implementing user authentication measures, and obtaining informed consent for data sharing can help protect participants' privacy and ensure the integrity of the research discussions.

By proactively addressing these obstacles and adopting suitable strategies, the DHIMAHİ can create an inclusive, engaging, and productive platform for researchers and participants to collaborate effectively.



# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139

E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com)/ principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## Impact of the Forum:

The practice of the DHIMAH - Maheshtala College Interdisciplinary Research Forum has had a profound impact on both students and faculty members. By fostering collaboration and knowledge-sharing across different disciplines, the forum has created a vibrant intellectual space that transcends traditional academic boundaries. Students have been able to explore new perspectives and develop a holistic understanding of complex issues by engaging with peers and experts from various fields. This interdisciplinary approach has not only enhanced critical thinking and problem-solving skills but has also inspired innovative research projects that address real-world challenges. Moreover, faculty members have witnessed increased synergy in their work, leading to interdisciplinary research collaborations and the publication of groundbreaking studies. Overall, the Maheshtala College Interdisciplinary Research Forum has nurtured a culture of interdisciplinary learning, propelling both individual growth and collective intellectual advancement.

## Resources required:

The Maheshtala College Online Interdisciplinary Research Forum requires specific resources for effective virtual collaboration. These include a reliable online platform with features like video conferencing and document sharing, high-speed internet for seamless interactions, access to a virtual library with digital resources, research tools and software, digital documentation and storage solutions, virtual mentoring and support, online workshops and webinars with experts, funding support, and technical assistance. These resources enable participants to engage in interdisciplinary research, access relevant literature, collaborate effectively, and receive guidance and support in an online environment.

## About the Institution

### Name of the Institution: MAHESHTALA COLLEGE

ii. Year of Accreditation:2016

iii. Address: BUDGE BUDGE TRUNK ROAD, KOLKATA-700141

iv. Grade awarded by NAAC: B+

v. E-Mail:[maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com)

vi. Contact person for further details: 7439501363 /6289482452

vii. Website:<https://www.maheshtalacollege.ac.in>



# MAHESHTALA COLLEGE

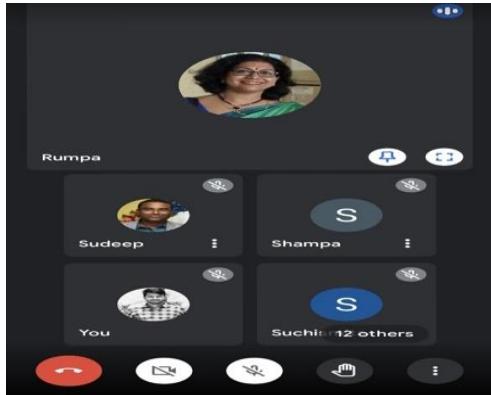
BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## DHIMAHİ: Maheshtala College Interdisciplinary Research Forum 1<sup>st</sup> meeting

**DATE – 17.07.2021**

**TIME 8-9:40PM**

- **NAME OF SPEAKER:** DR. RUMPA DAS (Principal, Maheshtala College), PROF. SUDEEP SARKAR (Assistant Professor, Department of Education)
- **TOPIC OF DISCUSSION:** Introduction, Objectives, impact & resources required for this forum.
- **NAME OF PARTICIPANTS:** – DR. RUMPA DAS (Principal, Maheshtala College), DR. SUCHANDRA BHATTACHARYA, PROF.SHAMPA DASGIFTA, DR. DEEPA BHATTACHARYA, PROF. LIPI HALDER, DR. SHARBANI CHATTOPADHAYAYA, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF AMIYA SARKAR PROF. DEEPSIKHA MUTSUDDI, PROF. DIPANWITA SARKAR, PROF. RANAJIT DAS, PROF. MONAMI BASU, PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, PROF. ASIS NASKAR, PROF. SALINI GHOSH. PPOF. KAKALI GHOSAL, PROF. JUYEL ALI, PROF. KAILASH MAHATO, DR. MONAMI BASU.



About this call	
People	Information
Sanatan Soren (You)	
Amiya Sarkar	
Anupama Das	
Asia Naskar	
Deepshikha M	
Dipanwita Sarkar	
Dr. Deepa Bhattacharyya	
Dr. Sharbani Chattopadhy...	
Lipi Halder	
Mohammed Johaed	
Rai Sarkar	
Rumpa Das	
Satyajit De	
Shampa Dasgupta	
Suchandra Bhattacharya	
Suchismita Neogi	
Sudeep Sarkar	



# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

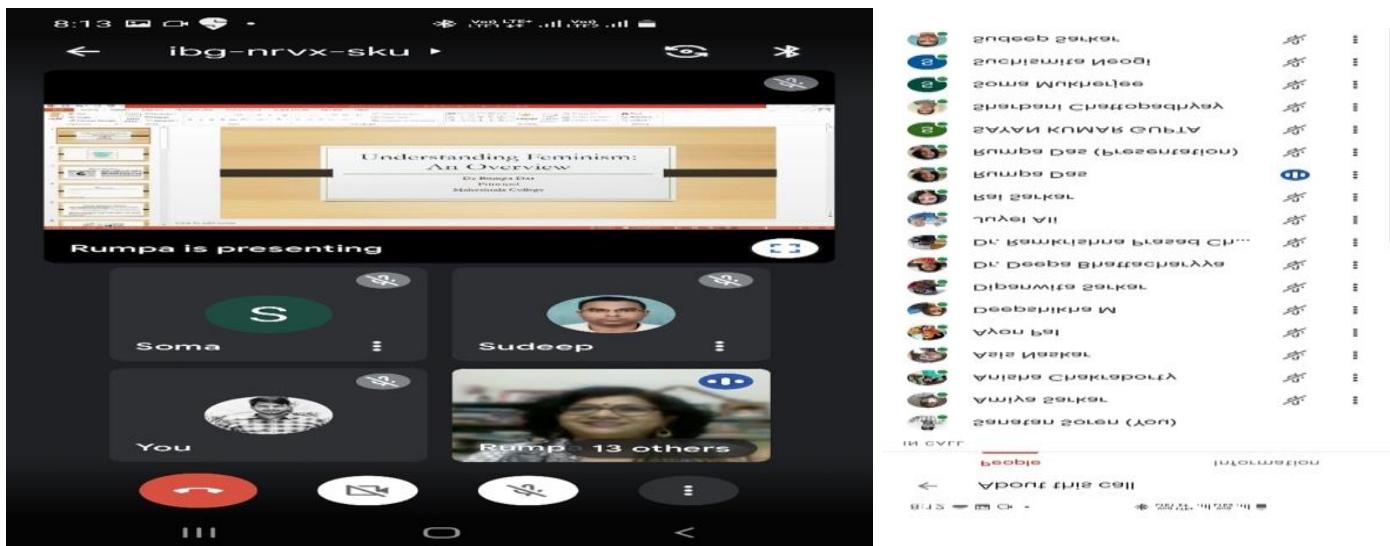
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## DHIMAH - Maheshtala College Interdisciplinary Research Forum 2<sup>nd</sup> meeting

**DATE – 14.08.2021**

**TIME 8-9:30PM**

- **NAME OF SPEAKER:** DR. RUMPA DAS (PRINCIPAL, MAHESHTALA COLLEGE).
- **TOPIC OF DISCUSSION:** **Understanding Feminism: An Overview(1<sup>st</sup> Session )**
- **NAME OF PARTICIPANTS:** DR. SUCHANDRA BHATTACHARYA, PROF.SHAMPA DASGUITA, DR. DEEPA BHATTACHARYA, PROF. LIPI HALDER,DR. SHARBANI CHATTOPADHAYAYA, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF AMIYA SARKAR PROF. DEEPSIKHA MUTSUDDI, PROF. DIPANWITA SARKAR, PROF. RANAJIT DAS, PROF. MONAMI BASU, PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, PROF. ASIS NASKAR, PROF. SALINI GHOSH, PROF. JUYEL ALI , PROF. KAILASH MAHATO, DR. MONAMI BASU.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139

E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

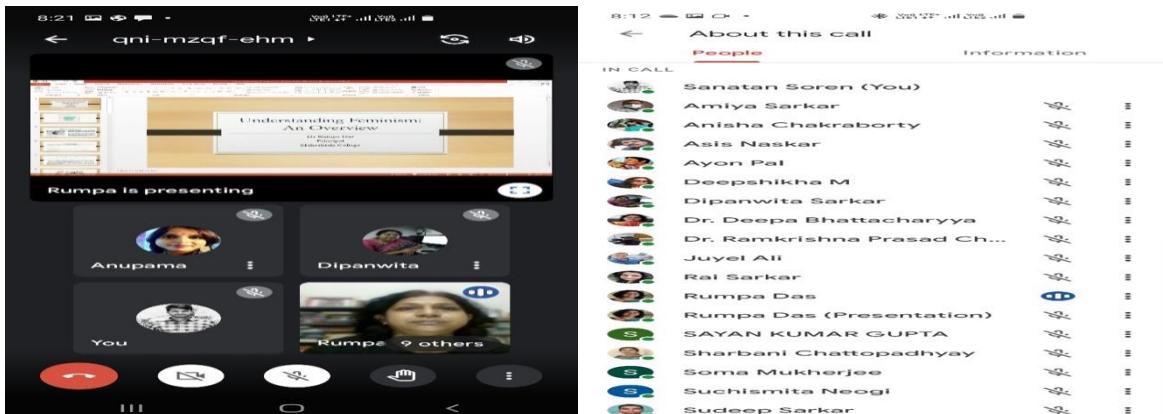
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## DHIMAHİ: Maheshtala College Interdisciplinary Research Forum 3<sup>rd</sup> meeting

**DATE – 21.08.2021**

**TIME 8-9:40PM**

- **NAME OF SPEAKER:** DR. RUMPA DAS (PRINCIPAL, MAHESHTALA COLLEGE).
- **TOPIC OF DISCUSSION:** Understanding Feminism: An Overview (2<sup>nd</sup> Session)
- **NAME OF PARTICIPANTS:** DR. SUCHANDRA BHATTACHARYA, PROF.SHAMPA DASGUITA, DR. DEEPA BHATTACHARYA, PROF. LIPI HALDER, DR. SHARBANI CHATTOPADHYAYA, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF AMIYA SARKAR PROF. DEEPSIKHA MUTSUDDI, PROF. DIPANWITA SARKAR, PROF. RANAJIT DAS, PROF. MONAMI BASU, PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, PROF. ASIS NASKAR, PROF. SALINI GHOSH, PROF. JUYEL ALI, PROF. KAILASH MAHATO, DR. MONAMI BASU, PROF AYAN PAL, PROF.ANISHA CHAKROBORTY, PROF. SOMA MUKHERJEE.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## DHIMAHİ: Maheshtala College Interdisciplinary Research Forum

*4<sup>th</sup> Meeting*

**DATE – 04.09.2021**

**TIME 8PM-9:30PM**

- **NAME OF SPEAKER:** Prof. Sonatan Soren (Assistant Professor, Department of History, Maheshtala College).
- **TOPIC OF DISCUSSION:** **Global Terrorism: Afghanistan & America (1979-2001)**
- **NAME OF PARTICIPANTS:** DR. RUMPA DAS (PRINCIPAL, MAHESHTALA COLLEGE), DR. SUCHANDRA BHATTACHARYA, PROF.SHAMPA DASGUITA, DR. DEEPA BHATTACHARYA, PROF. LIPI HALDER,DR. SHARBANI CHATTOPADHYAYA, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF AMIYA SARKAR PROF. DEEPSIKHA MUTSUDDI, PROF. DIPANWITA SARKAR, PROF. RANAJIT DAS, PROF. MONAMI BASU, PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, PROF. ASIS NASKAR, PROF. SALINI GHOSH, PROF. JUYEL ALI , PROF. KAILASH MAHATO, DR. MONAMI BASU, PROF. DEBASISH MITRA(ASSISTANT PROF. OF DIAMOND HARBOUR WOMENS' UNIVERSITY), PROF. SAHEB HEMBRAM(ASSISTANT PROF. OF SHYAMAPRASAD MUKHERJEE COLLEGE), PRASENJIT NASKAR(RESEARCH FELLOW, JU).





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139

E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

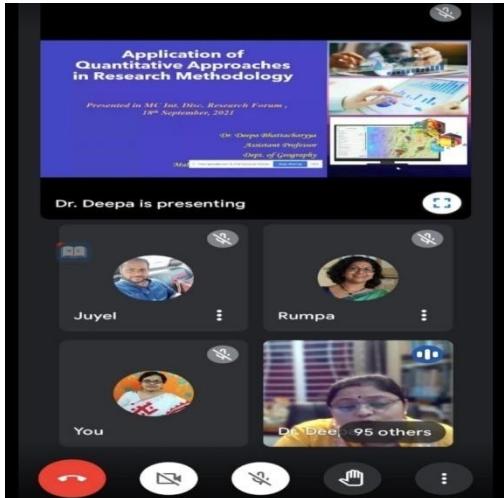
### MAHESHTALA COLLEGE

**5<sup>th</sup> Meeting**

**DATE – 18.09.2021**

**TIME 8PM-9PM**

- **NAME OF SPEAKER:** Dr. Deepa Bhattacharya (Assistant Professor, Department of Geography, Maheshtala College).
- **TOPIC OF DISCUSSION:** **Application of Quantitative Approaches in Research Methodology.**
- **NAME OF PARTICIPANTS:** DR. RUMPA DAS (PRINCIPAL, MAHESHTALA COLLEGE), DR. SUCHANDRA BHATTACHARYA, PROF.SHAMPA DASGIFTA, DR. DEEPA BHATTACHARYA, PROF. LIPI HALDER,DR. SHARBANI CHATTOPADHAYAYA, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF AMIYA SARKAR PROF. DEEPSIKHA MUTSUDDI, PROF. DIPANWITA SARKAR, PROF. RANAJIT DAS, PROF. MONAMI BASU, PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, PROF. ASIS NASKAR, PROF. SALINI GHOSH, PROF. JUYEL ALI , PROF. KAILASH MAHATO, SOUMYADEEP MONDAL(RESEARCHER, LONDON SCHOOL OF ECONOMICS).



About this call	
People	Information
Soma Naskar	
Soumalya Purkait	
Soumi Ghosh	
Soumyadip Kayal	
Souvik Mondal	
Srijita Hait	
Srinita Roy	
Suchandra Bhattacharyya	
Suchismita Neogi	
SUDIPTA HALDER	
Suman Das	
SUMAN DAS	
Supritee Mondal	
SUPRIYA GAYEN	
Swati Panja	
Tamanna Mondal	
Tanay Saha	
Tanaya Karmakar	
Tania Guha	
Sudeep Sarkar left	



# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

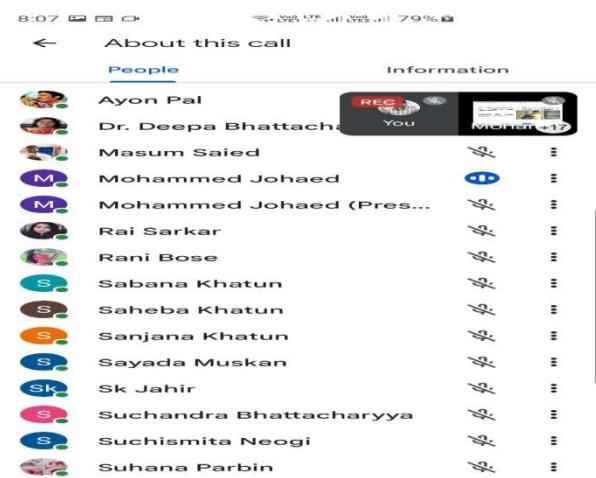
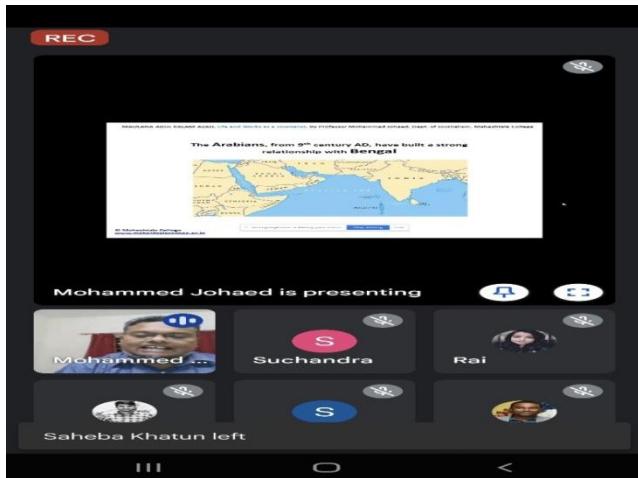
### MAHESHTALA COLLEGE

**6<sup>th</sup> Meeting**

**DATE – 27.11.2021**

**TIME 8PM-8:45PM**

- **NAME OF SPEAKER:** Dr. Deepa Bhattacharya (Assistant Professor, Department of Geography, Maheshtala College).
- **TOPIC OF DISCUSSION:** **Abul Kalam Azad: An account of his life and works as a journalist.**
- **NAME OF PARTICIPANTS:** DR. RUMPA DAS (PRINCIPAL, MAHESHTALA COLLEGE), DR. SUCHANDRA BHATTACHARYA, PROF.SHAMPA DASGIFTA, DR. DEEPA BHATTACHARYA, PROF. LIPI HALDER,DR. SHARBANI CHATTOPADHAYAYA, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF AMIYA SARKAR PROF. DEEPSIKHA MUTSUDDI, PROF. DIPANWITA SARKAR, PROF. RANAJIT DAS, PROF. MONAMI BASU, PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, PROF. ASIS NASKAR, PROF. SALINI GHOSH.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

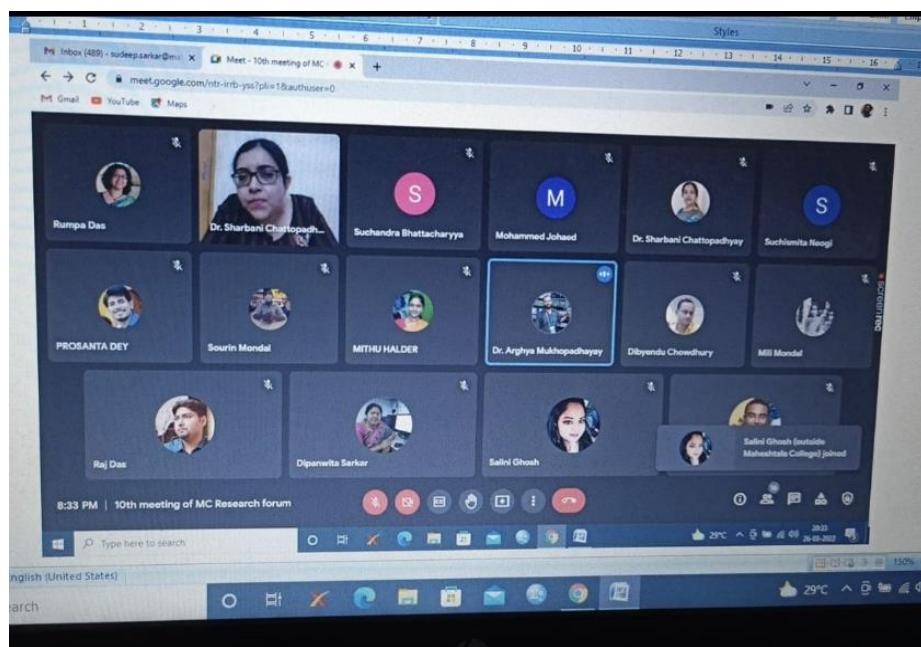
## INTERDISCIPLINARY RESEARCH FORUM MAHESHTALA COLLEGE

**7<sup>th</sup> Meeting**

**DATE – 25.03.22**

**TIME 8PM-9:45PM**

- **NAME OF SPEAKER:** Dr. Sharbani Chattapadhyay (Assistant Professor, Department of Sanskrit, Maheshtala College).
- **TOPIC OF DISCUSSION:** **Maharshi Bharata's Rasasutra, types of rasa and its application in performing Arts of India: A brief account.**
- **NAME OF PARTICIPANTS:** DR. RUMPA DAS (PRINCIPAL OF MAHESHTALA COLLEGE), PROF. SUCHANDRA BHATTACHARYYA, PROF. SUDEEP SARKAR, PROF. PRASANTA DEY, PROF. MD JOHAED, PROF. DIPANWITA SARKAR, PROF. SUCHISMITA NEOGI, PROF DIBYENDU CHOWDHURY, PROF. SHALINI GHOSH, PROF. MITHU HALDER, PROF. RAJ DAS.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

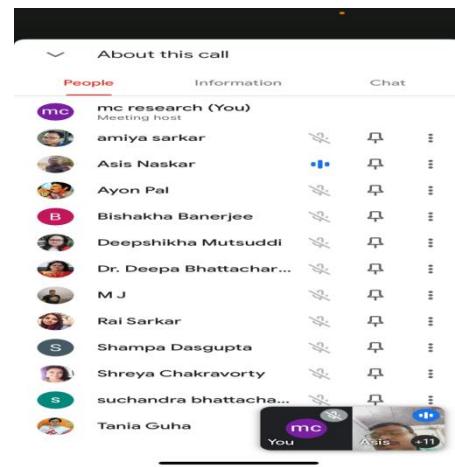
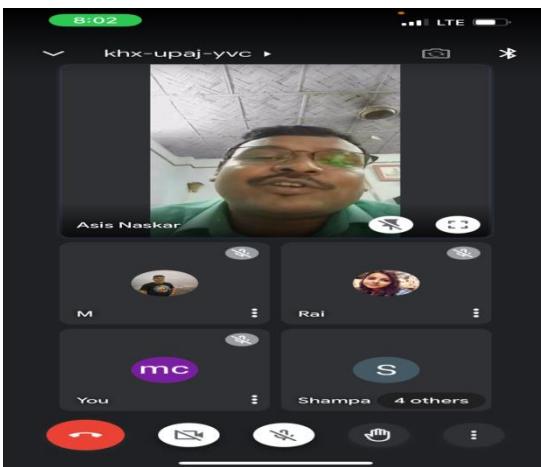
## INTERDISCIPLINARY RESEARCH FORUM MAHESHTALA COLLEGE

**8<sup>th</sup> Meeting**

**DATE – 27.08.22**

**TIME 8PM-9PM**

- **NAME OF SPEAKER:** Prof Asish Naskar, SACT, Dept. Of Political Science, Maheshtala College.
- **TOPIC OF DISCUSSION:** Revisiting Untouchability in the Context of the Gandhi-Ambedkar Debate.
- **NAME OF PARTICIPANTS:** DR. SUCHANDRA BHATTACHARYYA, PROF. SHAMPA DASGUPTA, DR. DEEPA BHATTACHARYA, PROF. AMIYA SARKAR, PROF. SUDEEP SARKAR, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF. DEEPSIKHA MUTSUDDI, PROF. RAI SARKAR, PROF. TANIA GUHA, PROF. AYAN PAL, PROF. SHREYA CHAKRABORTY.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com)/ principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

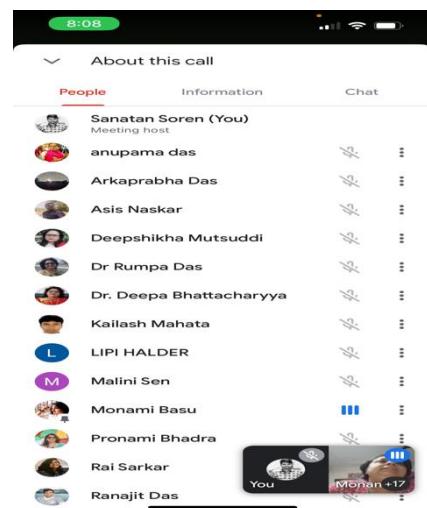
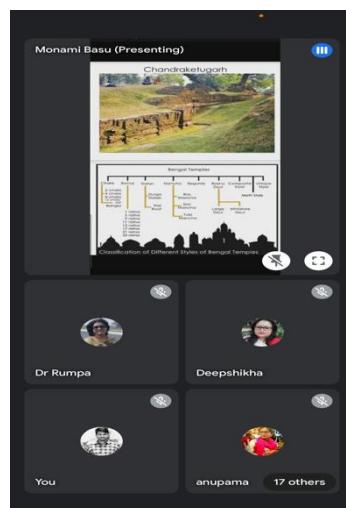
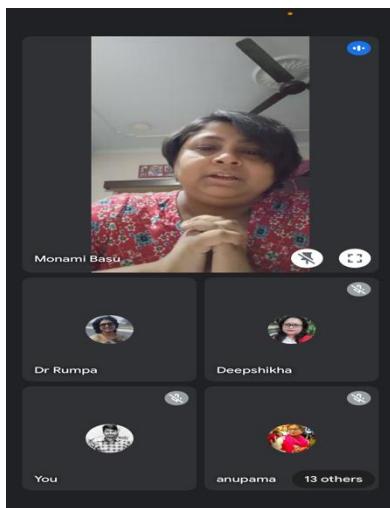
### MAHESHTALA COLLEGE

**9<sup>th</sup> Meeting**

**DATE – 21.04.23**

**TIME 8PM-9:30PM**

- **NAME OF SPEAKER** – Dr.MONAMI BASU, SACT, DEPT. OF BENGALI, MAHESHTALA COLLEGE
- **TOPIC OF DISCUSSION**–TEMPLE ARCHITECTURE OF BENGAL
- **NAME OF PARTICIPANTS** –DR. RUMPA DAS (Principal, Maheshtala College),DR. SUCHANDRA BHATTACHARYYA, PROF MALINI SEN, DR. SUDIPTA JANA,DR.DEEPA BHATTACHARYA,PROF.LIPI HALDER, PROF. SUBHASIS DE, PROF. SONATAN SOREN,PROF. DEEPSIKHA MUTSUDDI,PROF. RANAJIT DAS, PROF. RAI SARKAR,PROF. SUCHISMITA NEOGI PROF. ANUPAMA DAS, PROF. TANIA GUHA, PROF. PRONAMI BHADRA, PROF. ASIS NASKAR, PROF. SALINI GHOSH, PROF. KAILASH MAHATA.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [mahestalacollege@yahoo.com](mailto:mahestalacollege@yahoo.com) principal.mahestalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.mahestalacollege.ac.in](http://www.mahestalacollege.ac.in)

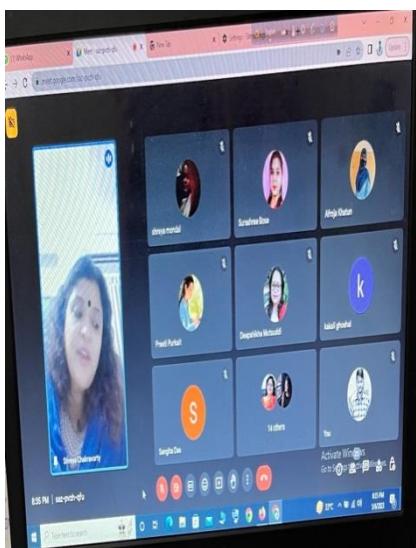
## INTERDISCIPLINARY RESEARCH FORUM MAHESHTALA COLLEGE

10<sup>th</sup> Meeting

DATE – 06.05.23

TIME 8PM-9:10PM

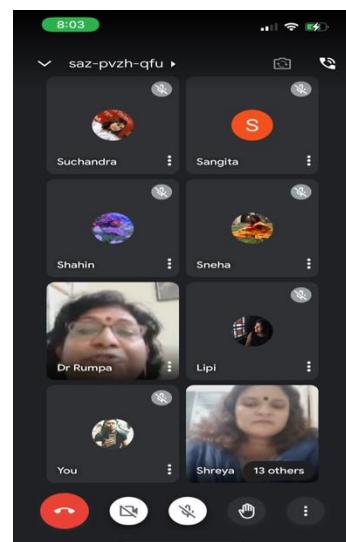
- **NAME OF SPEAKER** – Dr. SHREYA CHAKRABORTY, Assistant Professor, Department of English, Budge Budge College.
- **TOPIC OF DISCUSSION**– BANKIMCHANDRA AND MESMARISM.
- **NAME OF PARTICIPANTS** –DR. RUMPA DAS (Principal, Maheshtala College), DR. SUCHANDRA BHATTACHARYA, DR. DEEPA BHATTACHARYA, PROF. SONATAN SOREN, PROF. MD JOHAED, PROF. DEEPSIKHA MUTSUDDI, PROF. DIPANWITA SARKAR, PROF. RANAJIT DAS, PROF. MONAMI BASU, PROF. RAI SARKAR, PROF. ASIS NASKAR, PROF. SALINI GHOSH. PPOF. KAKALI GHOSAL.



About this call

People Information Chat

- Ranjit Saren (You)
- Sanatan Soren Meeting host
- Afrina Khatun
- Afroja Khatun
- Aziza Khatun
- Biswaroop Chatterjee
- Deepshikha Mutsuddi
- Dipanwita Sarkar
- Dr. Deepa Bhattacharyya
- kakali ghoshal
- Lipi Chakraborty
- Monami Basu
- Payel Pramanick
- Piu Mondal



# INTERDISCIPLINARY RESEARCH FORUM

## MAHESHTALA COLLEGE

11<sup>th</sup> Meeting

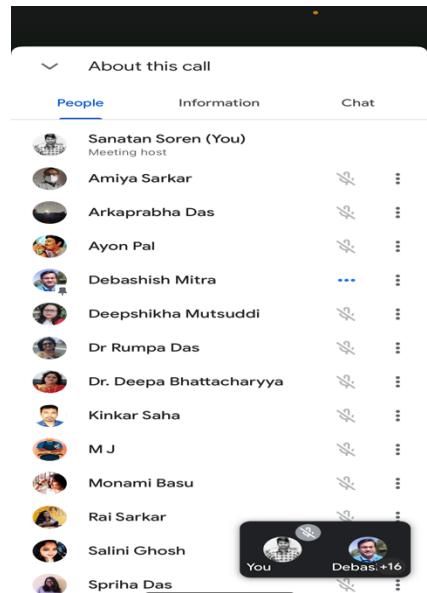
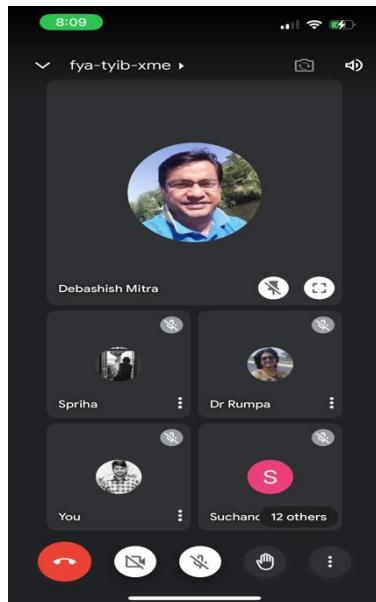
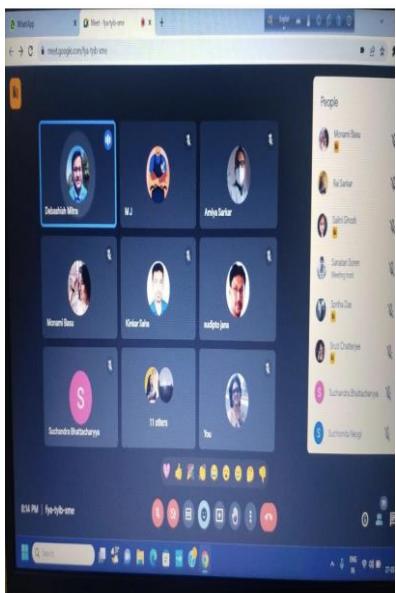
DATE – 27.05.23

TIME 8PM-9:20PM

- **NAME OF SPEAKER** – DR. DEBASISH MITRA (Associate Professor, Department of Political Science, Diamond Harbour Women's University)

- **TOPIC OF DISCUSSION** – Nationalism or Ethnocentrism: Relevance and Construction.

- **NAME OF PARTICIPANTS** – DR. RUMPA DAS (PRINCIPAL OF MAHESHTALA COLLEGE), DR. SUCHANDRA BHATTACHARYYA, DR. SUDIPTO JANA, DR. DEEPA BHATTACHARYA, PROF. DEEP SHIKHA MUTSUDDI, PROF. AMIYA SARKAR, PROF. SONATAN SOREN, PROF. MD. JOHAED, PROF. DIPANWITA SARKAR, PROF. ASIS NASKAR, DR. MONAMI BASU, PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, PROF. AYON PAL, PROF. SALINI GHOSH, DR. KINKAR SAHA, SPRIBHA DAS, RANVEER SINGH, ARKAPRABHA DAS, SRUTI CHATTERJEE.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139

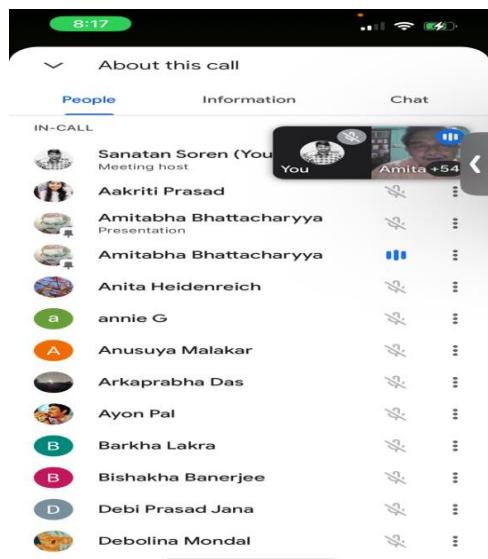
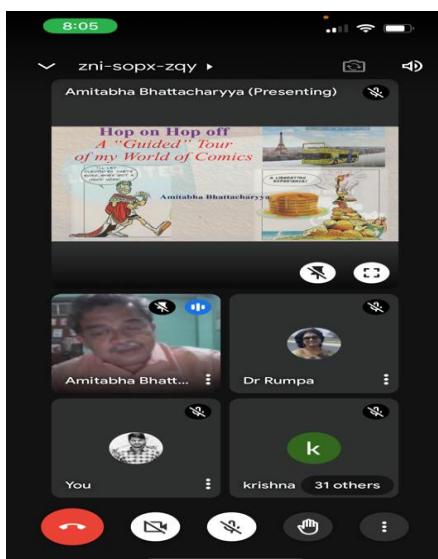
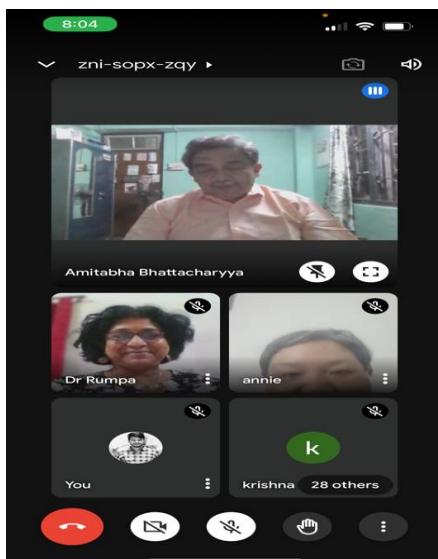
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

INTERDISCIPLINARY RESEARCH FORUM  
MAHESHTALA COLLEGE  
**12<sup>th</sup> Meeting**  
**DATE – 03.06.23**  
**TIME 8PM-9:10PM**

- **NAME OF SPEAKER** – DR. AMITABHABHATTACHARYYA, ASSOCIATE PROFESSOR, DEPARTMENT OF PHYSICS, SIKKIM UNIVERSITY.
- **TOPIC OF DISCUSSION** – **Hop on, Hop off: A Guided Tour of my World of Comics.**
- **NAME OF PARTICIPANTS** – DR. RUMPA DAS (PRINCIPAL OF MAHESHTALA COLLEGE), DR.SUCHANDRA BHATTACHARYYA, PROF. SHAMPA DASGUPTA, PROF. KABITA MONDAL,DR. SUDIPTO JANA, DR. DEEPA BHATTACHARYA,DR. SHARBANI CHATTOPADHYAY, PROF. SUBHASIS DE, PROF. SHREYA BHATTACHARJI, PROF. BARUN BISWAS, PROF. DEEPSHIKHA MUTSUDDI, PROF.MALINI SEN, PROF. SONATAN SOREN, PROF. MD. JOHAED, PROF. DIPANWITA SARKAR, PROF. ASIS NASKAR, DR. MONAMI BASU, PROF. RAI SARKAR ,PROF. AYON PAL, PROF. SALINI GHOSH, PROF. DEBIPRASAD JANA, PROF. BISAKHA BANERJEE,PROF. PRASANTA PAUL, PROF. SASANKA SELHAR MAITY,DR. SREYASI CHATTERJEE, SPRIHA DAS, ARKAPRABHA DAS, SRUTI CHATTERJEE, PRITY CHOUDHARY,DEBOLINAMONDAL, SOUMYADEEP HALDER, PARTHA SARATHI DAS, BARKHA R. LAKRA,SULAGNA DUTTA,AAKRITI PRASAD, ANUSUA MALAKAR, KEYA NANDY, LAWRENCE REISNER, LISA THOMAS, PUJA MAJHI, RICHA PALLAVI, SANCHARI AMBOLI, VIKASH KUMER,APARAJITA GURUNG,PRAHANT DUTTA,ROHIT PORWAL, RUPAK MUKHERJEE,BEDIKA BHATTACHARJEE, ANKITA SAHA, SOUMEN MALLIK, SUMANA MAJI, SOVAN CHAKRABORTY, SREEPARNA NATH, PRONAB DEY, KRISHNENDU DAS , DIPANJAN MITRA. JOYJIT GHOSH.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

MAHESHTALA COLLEGE

13<sup>th</sup> Meeting

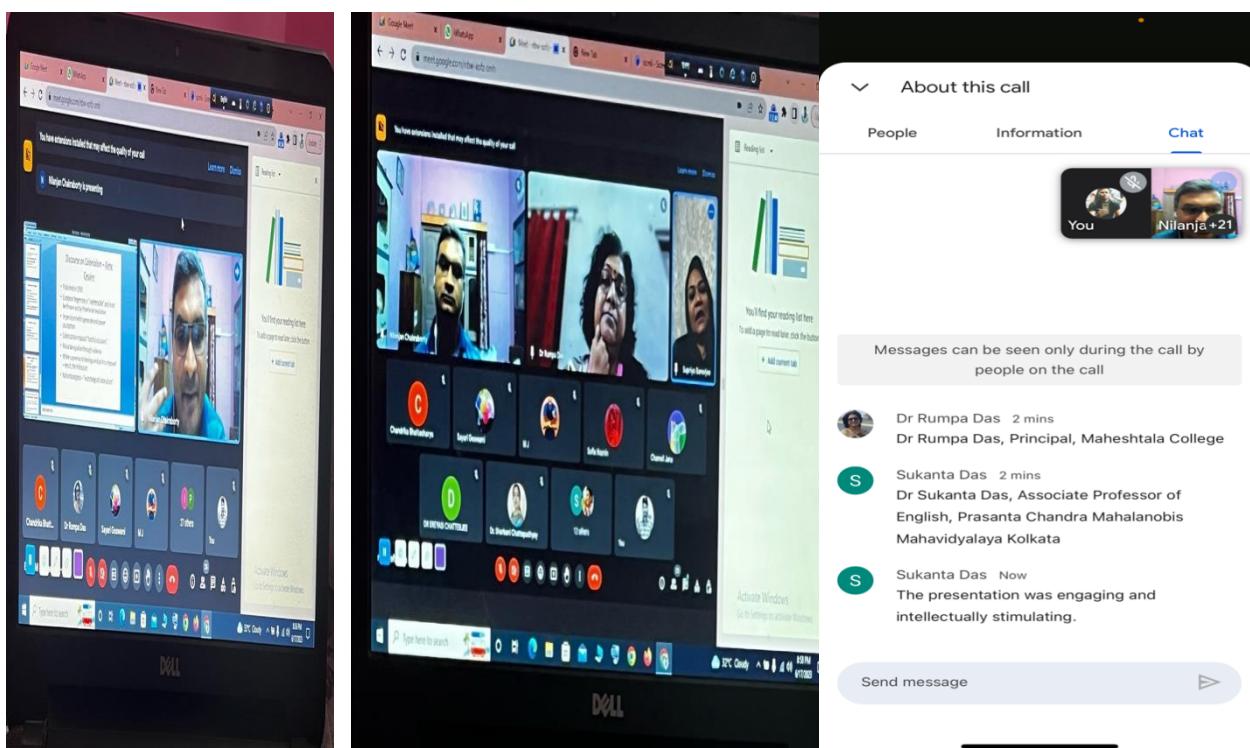
DATE – 17.06.23

TIME 8PM-9:17PM

• NAME OF SPEAKER – DR. NILANJAN CHAKRABORTY, ASSISTANT PROFESSOR, DEPARTMENT OF ENGLISH, PANCHLA MAHAVIDYALAYA.

• TOPIC OF DISCUSSION –AFRICAN LITERATURE: THE BLACK JOY.

• NAME OF PARTICIPANTS – DR. RUMPA DAS (PRINCIPAL OF MAHESHTALA COLLEGE),DR. DEEPA BHATTACHARYA,DR. SHARBANI CHATTOPADHYAY,PROF. DEEPSHIKA MUTSUDDI, PROF.MALINI SEN, PROF. SONATAN SOREN, PROF, MD. JOHAED, PROF. DIPANWITA SARKAR, PROF. ASIS NASKAR, DR., PROF. RAI SARKAR , PROF. SUCHISMITA NEOGI,DR.SUPRIYA BANERJEE, PROF. BISAKHA BANERJEE,PROF,DR. SREYASI CHATTERJEE, DR.SUKANTA DAS, PIYALI GOSWAMI, PROMA GOSWAMI, SANJAY DHALI, SAYANTI MONDAL, SAYARI GOSWAMI, SOHINI ROY , SWASTIKA SENGUPTA, VIKASH KUMER, RUPAM GHOSH, SANJAY DHALI, SATABDI CHATTERJEE, SAYARI GOSWAMI, SOFIA NAZNIN, MONIKA RANI, NEHA GHOSH, OISIKHA MUKHERJEE,PRITY CHOUDHARY,CHAMELI JANA,DEBARPITA ROY.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139

E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

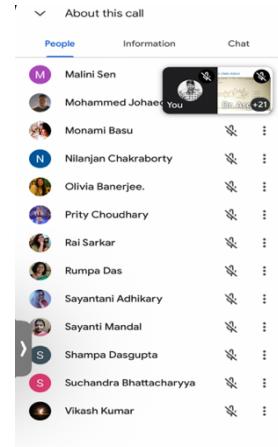
MAHESHTALA COLLEGE

**14<sup>th</sup> Meeting**

**DATE – 15.07.23**

**TIME 8PM-9:30PM**

- **NAME OF SPEAKER – DR. ARGHYA MUKHOPADHYAY, SACT (JOURNALISM & MASS COMMUNICATION).**
- **TOPIC OF DISCUSSION – Reflection of Social psyche in Matrimonial Advertisement: Alongitudinal study of matrimonial columns in select newspapers in West Bengal.**
- **NAME OF PARTICIPANTS – DR. RUMPA DAS (PRINCIPAL OF MAHESHTALA COLLEGE), DR. DEEPA BHATTACHARYA, DR. SHARBANI CHATTOPADHYAY, PROF. DEEPSHIKA MUTSUDDI, PROF. MALINI SEN, PROF. SONATAN SOREN, PROF. MD. JOHAED, PROF. DIPANWITA SARKAR, PROF. ASIS NASKAR, DR., PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, DR. MONAMI BASU, PROF. NILANJAN CHAKRABORTY, PROF. SHAMPA DASGUPTA, DR. SUCHAMDRA BHATTACHARYA, SAYANTI MONDAL, SAYANTANI ADHIKARY, VIKASH KUMER.**





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

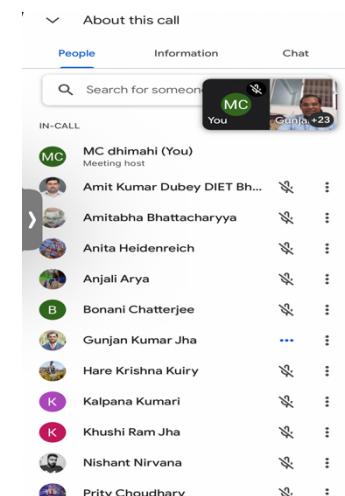
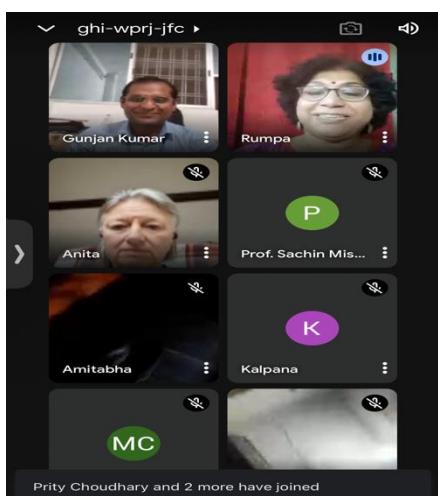
MAHESHTALA COLLEGE

**15<sup>th</sup> Meeting**

**DATE – 29.07.23**

**TIME 8PM-9:30PM**

- **NAME OF SPEAKER** – GUNJAN KUMAR JHA, SENIOR RESEARCH FELLOW, DEPARTMENT OF ENGLISH STUDIES, CENTRAL UNIVERSITY OF JHARKHAND, SUPERVISOR- PROF.(DR.) SHREYA BHATTACHARJI.
- **TOPIC OF DISCUSSION** –**Historical Detective Fiction & Neo-Victorianism: Unmasking Edward Marston's God of Sin in Murder on the Brighton Express.**
- **NAME OF PARTICIPANTS** – DR. RUMPA DAS (PRINCIPAL OF MAHESHTALA COLLEGE), DR. DEEPA BHATTACHARYA, DR. SHARBANI CHATTOPADHYAY, PROF. DEEPSHIKA MUTHSUDDI, PROF. MALINI SEN, PROF. SONATAN SOREN, PROF. MD. JOHAED, PROF. DIPANWITA SARKAR, PROF. ASIS NASKAR, DR., PROF. RAI SARKAR, PROF. SUCHISMITA NEOGI, DR. SUPRIYA BANERJEE, PROF. BISAKHA BANERJEE, PROF. DR. SREYASI CHATTERJEE, DR. SUKANTA DAS, PIYALI GOSWAMI, PROMA GOSWAMI, SANJAY DHALI, SAYANTI MONDAL, SAYARI GOSWAMI, SOHINI ROY, SWASTIKA SENGUPTA, VIKASH KUMER, RUPAM GHOSH, SANJAY DHALI, SATABDI CHATTERJEE, SAYARI GOSWAMI, SOFIA NAZNIN, MONIKA RANI, NEHA GHOSH, OISIKHA MUKHERJEE, PRITY CHAUDHARY, CHAMELI JANA, DEBARPITA ROY, AMIT KUMER DUBEY, ANITA HEIDENREICH, ANJALI ARYA, BONANI CHATTERJEE, HARE KRISHNA KUIRY, KALPANA KUMARI, KHUSI RAM JHA, PRITY CHAUDHURY.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139

E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com

①: 6289482452 ( Office )

Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

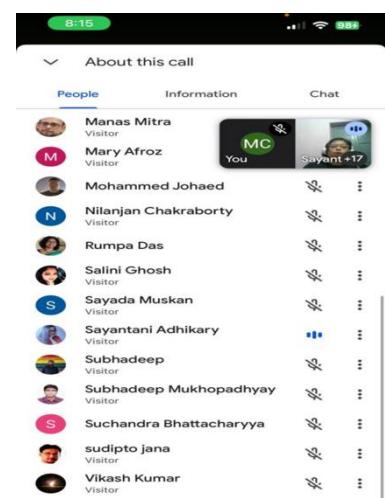
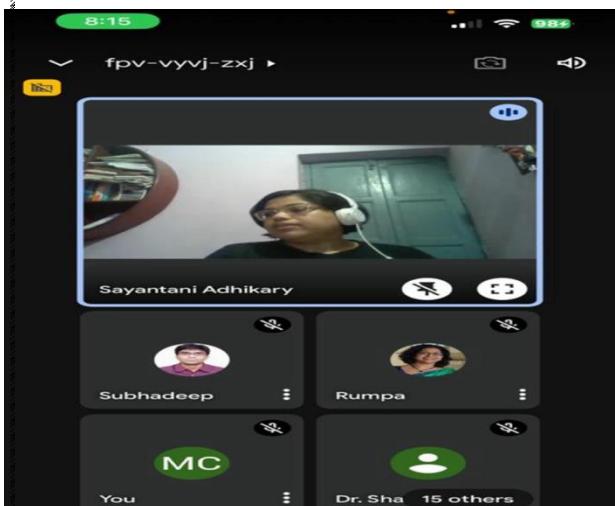
MAHESHTALA COLLEGE

16<sup>th</sup> Meeting

DATE – 25.08.23

TIME 8PM-9:30PM

- NAME OF SPEAKER – PROF. SAYANTANI ADHIKARY, ASSISTANT PROFESSOR, DEPARTMENT OF HISTORY, SADHAN CHANDRA MAHAVIDYALAYA.
- TOPIC OF DISCUSSION –DANCE AS PHYSICAL CULTURE: PERSPECTIVES IN LATE COLONIAL BENGAL.
- NAME OF PARTICIPANTS – DR. RUMPA DAS (PRINCIPAL OF MAHESHTALA COLLEGE), DR.SUCHANDRA BHATTACHARYYA, DR. SUDIPTO JANA,DR. DEEPA BHATTACHARYA,PROF. DEEPSHIKA MUTSUDDI, PROF. AMIYA SARKAR, PROF. SONATAN SOREN, PROF. MD. JOHAED, PROF. DIPANWITA SARKAR, PROF. ASIS NASKAR, DR. MONAMI BASU, PROF. RAI SARKAR , PROF. SUCHISMITA NEOGI, PROF. AYON PAL, PROF. SALINI GHOSH, PROF. MANAS GHOSH, PROF. NILANJAN CHAKRABORTY, MARY AFROZ, SAYADA MUSKAN, SUBHADEEP MUKHOPADHYAY, VIKASH KUMER.





# MAHESHTALA COLLEGE

BUDGE BUDGE TRUNK ROAD, MAHESHTALA, KOLKATA – 700139  
E-mail: [maheshtalacollege@yahoo.com](mailto:maheshtalacollege@yahoo.com) principal.maheshtalacollege@gmail.com  
①: 6289482452 ( Office )  
Website: [www.maheshtalacollege.ac.in](http://www.maheshtalacollege.ac.in)

## INTERDISCIPLINARY RESEARCH FORUM

MAHESHTALA COLLEGE

17<sup>th</sup> Meeting

DATE – 23.09.23

TIME 8PM-9:35PM

- NAME OF SPEAKER- DR. RUMPA DAS (PRINCIPAL, MAHESHTALA COLLEGE).
- TOPIC OF DISCUSSION – **Contemporary Women-Centric Films and Web series: Propagating Myth as Reality?**
- NAME OF PARTICIPANTS - DR.SUCHANDRA BHATTACHARYYA, PROF. SHAMPA DASGUPTA, DR. DEEPA BHATTACHARYA,DR. SHARBANI CHATTOPADHYAY,PROF. DEEPSHIKHA MUTSUDDI, PROF.MALINI SEN, PROF. SONATAN SOREN, PROF, MD. JOHAED, PROF. DIPANWITA SARKAR, PROF. ASIS NASKAR, DR., PROF. RAI SARKAR , PROF. SUCHISMITA NEOGI,DR.SUPRIYA BANERJEE, PROF. BISAKHA BANERJEE,PROF,DR. SREYASI CHATTERJEE, DR.SUKANTA DAS, PIYALI GOSWAMI, PROMA GOSWAMI, SANJAY DHALI, SAYANTI MONDAL, SAYARI GOSWAMI, SOHINI ROY , SWASTIKA SENGUPTA, VIKASH KUMER, RUPAM GHOSH, SANJAY DHALI, SATABDI CHATTERJEE, SAYARI GOSWAMI, SOFIA NAZNIN, MONIKA RANI, NEHA GHOSH, OISIKHA MUKHERJEE, PRITY CHOURDHARY,CHAMELI JANA,DEBARPITA ROY, AMIT KUMER DUBEY, ANITA HEIDENREICH, ANJALI ARYA, BONANI CHATTERJEE,HARE KRISHNA KUIRY,KALPANA KUMARI,KHUSI RAM JHA, PRITY CHOURDHURY,,AMITABHA BHATTACHARYA, SPRIHA DAS, ROSHAN RAJ SINGH.



## LIST OF PUBLICATIONS

### Maheshtala College 2019-2024

***Number of research papers published per teacher in the Journals notified on UGC CARE list during the last six years – 17***

Year	2019	2020	2021	2022	2023	2024
No. of publications	03	01	NIL	03	07	03

#### **List of Journal:**

	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Calendar Year of publication	ISSN number	Link to the recognition in UGC enlistment of the Journal /Digital Object Identifier (doi) number		
							Link to website of the Journal	Link to article / paper / abstract of the article	Is it listed in UGC Care list
1.	Pixel Value Ordering with Prediction Error Expansion Based High Fidelity Reversible Data Hiding Scheme	Satyajit De	Computer Science	International Journal of Applied Engineering Research (IJAER)	2019	0973-4562	<a href="https://dx.doi.org/10.37622/IJAER/14.4.2019.997-1005">https://dx.doi.org/10.37622/IJAER/14.4.2019.997-1005</a>	<b>Yes</b>	
2.	Reversible Data Hiding Scheme using Prediction Error Expansion in Pixel Value Blocking and Ordering	Satyajit De	Computer Science	International Journal of Applied Engineering Research (IJAER)	2019	0973-4562	<a href="https://dx.doi.org/10.37622/IJAER/14.8.2019.2029-2037">https://dx.doi.org/10.37622/IJAER/14.8.2019.2029-2037</a>	<b>Yes</b>	
3.	Adjacent Pixel Values Blocking and Prediction Error Expansion Based High	Satyajit De	Computer Science	International Journal of Applied Engineering Research (IJAER)	2019	0973-4562	<a href="https://dx.doi.org/10.37622/IJAER/14.11">https://dx.doi.org/10.37622/IJAER/14.11</a>	<b>Yes</b>	

	Fidelity Hiding Scheme	Reversible Data						.2019.2585-2595	
4.	GNSS er tatyā ebong khetra samikhai er proyog: ekti alochona	Dr. Deepa Bhattacharjee	Geography	Bhugol Swadesh Charcha (Print Only)	2020	2581-4788	<a href="https://ugccare.unipune.ac.in/Apps1/User/WEBA/SearchList">https://ugccare.unipune.ac.in/Apps1/User/WEBA/SearchList</a>	<a href="https://www.maheshtalcollege.ac.in/research-papers">https://www.maheshtalcollege.ac.in/research-papers</a>	Yes
5.	A generalized line segmentation method for multi-script handwritten text documents	Payel Rakshit	Computer Science	Expert Systems with Applications <b>(Impact Factor: 7.5)</b>	2022	0957-4174	<a href="https://www.sciedirect.com/journal/expert-systems-with-applications">https://www.sciedirect.com/journal/expert-systems-with-applications</a>	<a href="https://doi.org/10.1016/j.eswa.2022.118498">https://doi.org/10.1016/j.eswa.2022.118498</a>	Yes
6.	Comparative study on the performance of the state-of-the-art CNN models for handwritten Bangla character recognition	Payel Rakshit	Computer Science	Multimedia Tools and Applications <b>(Impact Factor: 3.0)</b>	2022	1380-7501	<a href="https://link.springer.com/journal/11042">https://link.springer.com/journal/11042</a>	<a href="https://doi.org/10.1007/s11042-022-13909-6">https://doi.org/10.1007/s11042-022-13909-6</a>	Yes
7.	An Ecoepidemic seasonally forced model for the combined effects of fear, additional foods and selective predation	Sasanka Shekhar Maity	Mathematics	Journal of Biological Systems	2022	0218-3390	<a href="https://www.worldscientific.com/worldscinet/jbs">https://www.worldscientific.com/worldscinet/jbs</a>	<a href="https://www.worldscientific.com/doi/10.1142/S0218339023500316">https://www.worldscientific.com/doi/10.1142/S0218339023500316</a>	Yes
8.	Optimization of time-dependent fuzzy multi-objective reliability redundancy allocation problem for n-stage series-parallel system	Satyajit De	Computer Science	Innovations in Systems and Software Engineering	2023	1614-5046	<a href="https://link.springer.com/journal/11334">https://link.springer.com/journal/11334</a>	<a href="https://doi.org/10.1007/s11334-023-00539-w">https://doi.org/10.1007/s11334-023-00539-w</a>	Yes
9.	Optimization of time based fuzzy multi-objective reliability redundancy allocation problem for xj-out-of-m system using tuning and neighborhood based fuzzy MOPSO algorithm	Satyajit De	Computer Science	Applied Soft Computing <b>(Impact Factor: 7.2)</b>	2023	1568-4946	<a href="https://www.sciedirect.com/journal/applied-soft-computing">https://www.sciedirect.com/journal/applied-soft-computing</a>	<a href="https://doi.org/10.1016/j.apusc.2023.110998">https://doi.org/10.1016/j.apusc.2023.110998</a>	Yes
10.	Document Image Skew Detection and Correction: A Survey	Barun Biswas	Computer Science	International Journal of Innovative Research in Technology	2023	2349-6002	<a href="https://ijirt.org/">https://ijirt.org/</a>	<a href="https://ijirt.org/master/publishedpaper/IJIRT158871_PAPER.pdf">https://ijirt.org/master/publishedpaper/IJIRT158871_PAPER.pdf</a>	Yes

11.	An Overview of Existing Literature on Document Skew Detection	Barun Biswas	Computer Science	Malaysian Journal of Computer Science	2023	0127-9084	<a href="https://ejournal.um.edu.my/index.php/MJCS">https://ejournal.um.edu.my/index.php/MJCS</a>	<a href="https://doi.org/10.22452/mjcs.vol36no4.5">https://doi.org/10.22452/mjcs.vol36no4.5</a>	Yes
12.	Landform and Land Use Characteristics in Leh Valley with special reference to Leh City and Adjacent Stakmo Fan Area	Dr. Deepa Bhattacharjee	Geography	Geographical Review of India	2023	0375-6386	<a href="https://geographicalsocietyofindia.org.in/geographical-review-of-india/">https://geographicalsocietyofindia.org.in/geographical-review-of-india/</a>	<a href="https://www.maheshtalacollege.ac.in/research-papers">https://www.maheshtalacollege.ac.in/research-papers</a>	Yes
13.	Optimization of time based fuzzy multi-objective reliability redundancy allocation problem for $x_j$ -out-of- $m$ system using tuning and neighborhood based fuzzy MOPSO algorithm	Payel Rakshit	Computer Science	Applied Soft Computing <b>(Impact Factor: 7.2)</b>	2023	1568-4946	<a href="https://www.sciencedirect.com/journal/applied-soft-computing">https://www.sciencedirect.com/journal/applied-soft-computing</a>	<a href="https://doi.org/10.1016/j.applsoft.2023.110998">https://doi.org/10.1016/j.applsoft.2023.110998</a>	Yes
14.	Role of Space in an Eco-Epidemic Predator-Prey System With The Effect of Fear and Selective Predation	Sasanka Shekhar Maity	Mathematics	Journal of Biological Systems	2023	0218-3390	<a href="https://www.worldscientific.com/worldscinet/jbs">https://www.worldscientific.com/worldscinet/jbs</a>	<a href="https://www.worldscientific.com/doi/10.1142/S0218339023500316">https://www.worldscientific.com/doi/10.1142/S0218339023500316</a>	Yes
15.	Historical digit recognition using CNN: a study with English handwritten digits	Payel Rakshit	Computer Science	Sadhana <b>(Impact Factor: 1.4)</b>	2024	0973-7677	<a href="https://link.springer.com/journal/12046">https://link.springer.com/journal/12046</a>	<a href="https://doi.org/10.1007/s12046-023-02322-wSadh">https://doi.org/10.1007/s12046-023-02322-wSadh</a>	Yes
16.	Changes in Land Use and Land Degradation in a Tourism-Centric City, Uttarakhand: A Field-Based Discussion	Dr. Deepa Bhattacharjee	Geography	Bhugol Swadesh Charcha	2024	2581-4788	<a href="https://abcdindex.com/Journal/Bhugol-Swadesh-Charcha-(print-only)-2581-4788">https://abcdindex.com/Journal/Bhugol-Swadesh-Charcha-(print-only)-2581-4788</a>	NA	Yes
17.	Optimization of time-dependent MORRAP for series-parallel system using improved NSGA-II in interval environment	Satyajit De	Computer Science	Innovations in Systems and Software Engineering <b>(Impact Factor: 1.1)</b>	2024	1614-5054	<a href="https://link.springer.com/journal/11334">https://link.springer.com/journal/11334</a>	<a href="https://doi.org/10.1007/s11334-024-00588-9">https://doi.org/10.1007/s11334-024-00588-9</a>	Yes

**Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years= 48**

Year	2019	2020	2021	2022	2023
No of publications	21	01	15	02	09

### List of Book Chapters/ conference proceedings:

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Calender Year of publication	ISBN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	Malini Sen	Communalism in the Context of Indian Politics: Past and Present	Bharatiyo Chalachitre Deshvaager Provab	NA	NA	National	2019	978-81-938439-5-6	Maheshtala College	Kalyani Foundation & Maheshtala College
2	Dr. Sanghamitra Ganguli	Visvambhara Basudhani	The Treatment of Nature in Kalidasa's Abhigyan Shakuntalam and Shakespeare's the Tempest: A Comparative Analysis	NA	NA	National	2019	978-81-9384-39-4-9	Maheshtala College	Maheshtala College & Kalyani Foundation
3	Dr. Sanghamitra Ganguli	Networking of Undergraduate Colleges: Academicv & Administrative Functions	Importance of Social Network in Teaching	NA	NA	National	2019	978-81-938439-6-3	Maheshtala College	Kalyani Foundation & Maheshtala College
4	Dr. Sanghamitra Ganguli	Communalism in the Context of Indian Politics: Past and Present	The Effects of Partition on the writings of Manto: A Brief Overview	NA	NA	National	2019	978-81-938439-5-6	Maheshtala College	Kalyani Foundation & Maheshtala College
5	Sanjibita	Visvambhara Basudhani	Environment in	NA	NA	National	2019	978-81-9384-39-	Maheشتala	Maheشتala

	Mondal		Vedic Literatures					4-9	la College	College & Kalyani Foundation
6	Ajijur Rahaman Mallick	Networking of Undergraduate Colleges: Academicv & Administrative Functions	omputers: Networking Use and Misuse	NA	NA	National	2019	978-81-938439-6-3	Maheshtala College	Kalyani Foundation & Maheshtala College
7	Amiya Sarkar	Ithihas Anusandhan	Oiponibik Jaan ghora-aain er otit o bortoman	NA	NA	NA	2019	978-81-935519-0-5	Maheshtala College	Paschimbanga Itihas Sangssad
8	Dr. Sharbani Chattopad hay	Asrutaveksa	Virarasa: One of the Important Rasas	NA	NA	NA	2019	978-93-88207-42-3	Maheshtala College	Paiolck
9	Dr. Sharbani Chattopad hay	Visvambhara Basudhani	Environmental Consciousness in Mahabharata: Some Glimses	NA	NA	National	2019	978-81-9384-39-4-9	Maheshtala College	Maheshtala College & Kalyani Foundation
10	Dipanwita Sarkar	Networking of Undergraduate Colleges: Academicv & Administrative Functions	Networking in Under Graduate Colleges-Role of an Academic Library with Special References to Inflibnet	NA	NA	National	2019	978-81-938439-6-3	Maheshtala College	Kalyani Foundation & Maheshtala College
11	Dipanwita Sarkar	Recent Trends on Library, Information and Society	Impact of Intellectual Property Right (IPR) in the Modern Age of Digital Era with Special References to Photographic Material	NA	NA	NA	2019	978-93-88207-68-3	Maheshtala College	Paiolck
12	Dipanwita Sarkar	Trends of LIS Education and Profession: Retrospect and Prospects	Changing Job Orientation in Library and Information Science Pofession with Special Reference to Academic Libraries	NA	NA	NA	2019	93-5408-963-3	Maheshtala College	Department of Library, Maharani Kasiswari College,Kol kata
13	Ranajit Das	Rastrotter Sahajpath Prosongo O Probaho	Sarvovoumikata Proyog O Prekhapot	NA	NA	NA	2019	978-81-940961-9-1	Maheshtala	Avenel Press

									College	
14	Prasanta Dey	Visvambhara Basudhani	Vedic Debata Apo	NA	NA	National	2019	978-81-9384-39-4-9	Maheshtala College	Maheshtala College & Kalyani Foundation
15	Dr. Deepa Bhattacharjee	Networking of Undergraduate Colleges: Academic & Administrative Functions	Academic, Research and Social Networks Management in Higher Education	NA	NA	National	2019	978-81-938439-6-3	Maheshtala College	Kalyani Foundation & Maheshtala College
16	Payel Rakshit	Document Processing Using Machine Learning	Arificial intelligence for Document Image Analysis	NA	NA	NA	2019	978-0367218478	Maheshtala College	A Chapman & Hall Book
17	Payel Rakshit	Document Processing Using Machine Learning	An Approach towards Character Recognition of Bangla Handwritten Isolated Characters	NA	NA	NA	2019	978-0367218478	Maheshtala College	A Chapman & Hall Book
18	Deepshikha Mutsuddi	Networking of Undergraduate Colleges: Academic & Administrative Functions	Networking and Sustainable Development in Undergraduate Colleges	NA	NA	National	2019	978-81-938439-6-3	Maheshtala College	Kalyani Foundation & Maheshtala College
19	Lipi Halder	Bangla Bhasai Biggan Charcha	Biggani O Sahitik: Binimoy- Rabindranath o Jagadischandra Basu	NA	NA	NA	2019	978-93-83161-03-4	Maheshtala College	Basu Mundran
20	Ankan Roy	Communalism in the Context of Indian Politics: Past and Present	Bharat-Bangladeshher Chhitmahal o Dharmaniropekhota( 1947-2017)	NA	NA	National	2019	978-81-938439-5-6	Maheshtala College	Kalyani Foundation & Maheshtala College
21	Kishore Roy Sarkar	Communalism in the Context of Indian Politics: Past and Present	Sampradayik Rajniti o Deshvaag: Prasanga Jalpaiguri Jela	NA	NA	National	2019	978-81-938439-5-6	Maheshtala College	Kalyani Foundation & Maheshtala College
22	Dr. Monami Basu	Bangla Chotogolpa : Kaler Britte	Toba Tek Sing	NA	NA	NA	2020	978-81-8064-302-6	Maheshtala College	Progressive Publishers

23	Dr. Rumpa Das	INTELLECT_US	Rokeya Sakhawat Hossain's Sultana's Dream: Scripting the Margins of an Ecofeminist Utopia	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
24	Dr. Indrani Ghosal	INTELLECT_US	Rabindra Bhavna o Shristite Prokrti	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
25	Malini Sen	INTELLECT_US	Environmental Ethics	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
26	Dr. Sanghamitra Ganguli	INTELLECT_US	Nature and its Representation in Impressionist to Post-Impressionist Art	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
27	Dr. Kabita Mondal	INTELLECT_US	Towards a Greener Atmosphere - Through Green Chemistry	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
28	Dr. Sharbani Chattopadhyay	INTELLECT_US	Kadambarite Prakrati Bhavna	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
29	Dr. Sharbani Chattopadhyay	Knowledge Management in Higher Education Institutions, Vol-2	E-Learning: A Necessary Medium of Modern Education System in India	NA	NA	NA	2021	978-81952757-5-5	Maheshtala College	Manipal University Jaipur

30	Dipanwita Sarkar	INTELLLECT_US	Environmental Sustainability and Libraries: Concept Of Green Library	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
31	Dipanwita Sarkar	Reorienting Information Literacy in the Library and Information Centers	Recent Advancements in Information Accessing by School Students Through Digital Medium : A Case Study	NA	NA	NA	2021	978-93-91572-22-8	Maheshtala College	Rahim Nandan
32	Ranajit Das	Rastronitir bivinno Prosongo	Shishu o Nari Pacharer birudhhe ebong nirapotta prosonge rastroniti	NA	NA	NA	2021	978-93-86529-42-8	Maheshtala College	Cognition Publications
33	Dr. Deepa Bhattacharjee	INTELLLECT_US	Interrelationship Among Climate, Soil and Vegetation: A Case Study of Gangotri, Uttarakhand	NA	NA	NA	2021	978-81-950332-0-1	Maheshtala College	Principal, Maheshtala College & Anjan Saha for Avenel Press
34	Sonatan Soren	Banglar Aprakasito Itihas: Sahitya, Somaj, Sangskriti, Arthaniti	Adibasi Santal Samaj o Tader Prathagata Chikitsar Upadan Samuher Sangkat: Purulia Jelar ekti Anusandhan	NA	NA	NA	2021	978-93-90621-34-7	Maheshtala College	Anima Biswas, Gangchil
35	Dr. Monami Basu	Galpacharcha	Narimed: Shailajananda Mukhopadhyay	NA	NA	NA	2021	978-93-83590-20-9	Maheshtala College	Bangiya Sahitya Sangsad
36	Dr. Monami Basu	Bahumatrik Dristite: Tungabhadrar Tire	Tungabhadrar Tire: Rajnoitik Hastakhep	NA	NA	NA	2021	978-93-90993-36-9	Maheshtala College	Bangiya Sahitya Sangsad
37	Dr. Monami Basu	Pramath Chowdhurir Prabandha : Pathe Pathantare	Sabujpatrer Mukhopattra	NA	NA	NA	2021	978-93-90993-01-7	Maheshtala College	Bangiya Sahitya Sangsad
38	Dr. Indrani Ghosal	Sundarboner Motsyajibider Jibon, Tader Loksangsangskriti ebong	NA	NA	NA	NA	2022	978-5473-456-4	Maheshtala College	Solil Ghosal, Granthan

		Loksahtya								
39	Dr. Monami Basu	Bangla Chotogolpa : Kaler Britte	Palanka: Narendranath Dutta	NA	NA	NA	2022	978-81-8064-324-8	Maheshta la College	Progressive Publishers
40	Dr. Rumpa Das	Post -Millennial Perceptions and Post- Pandemic Realities: Living Dystopian	Rhododendrons in the City: Surviving Dystopia, Living History	NA	NA	NA	2023	978-1-5275-0233-8	Maheshta la College	Cambridge Scholars Publishing
41	Dr. Rumpa Das	Women and Gender Equality in India	An Analysis of the Dominance of the Gender Role Categories in South Asia: A Case Study of Indian Films and Web Series	NA	NA	NA	2023	978-93-83930	Maheshta la College	Jaiswal, P & D S Rathour, GB Books
42	Satyajit De	Applied Computing for Software and Smart System	Multi-objective Fuzzy Redundancy Allocation for $x_j$ -out-of- $m_j$ System Using Fuzzy Ranked-based Multi-Objective PSO	NA	Proceedin gs of ACSS	Internation al	2023	978-981-19-6791-7	Maheshta la College	Springer
43	Satyajit De	International Conference on Security, Surveillance And Artificial Intelligence	Optimization of a Trapezoidal Fuzzy and Time-based Multi-objective Optimization Problem for Yi-Out-Of-Ni Systems	NA	ICSSAI	Internation al	2023	978-1-032-54997-2	Maheshta la College	CRC Press
44	Barun Biswas	Applied Computing for Software and Smart System	A Robust Approach to Document Skew Detection	NA	NA	NA	2023	978-981-19-7690-0	Maheshta la College	Springer
45	Dr. Deepa Bhattacharjee	Recent Trends In Science	Major Topographic Changes & Landscape Features of the Badrinath Valley, Uttarakhand, India	NA	NA	NA	2023	978-93-5911-113-1	Maheshta la College	Walnut Publications
46	Dr. Deepa Bhattachar	Indigenous Knowledge and Disaster Risk Deduction	Mountainous Hazard & Sustainable	NA	NA	NA	2023	978-3-031-26142-8	Maheshta la	Springer

	jee		Livlihood in Leh Valley						College	
<b>47</b>	Mohammed Johaed	Education In Resurgent in India	Challenges in of ICT in Higher Educational Institutes in West Bengal with a Focus on Mobile Learning	NA	NA	NA	2023	978-1-312-71160-0	Maheshtala College	Lulu Publications
<b>48</b>	Kishore Roy Sarkar	Itihas Onusandhan	Jalpaiguri jelar janabinyas o Avibasita Samaj (1947-1971)	NA	NA	NA	2023	8978-81-956-544-6-8	Maheshtala College	Paschimbanga Itihas Sangssad

## **Publications in different reputed UGC care list Journals**

Expert Systems With Applications 212 (2023) 118498

Contents lists available at ScienceDirect

Expert Systems With Applications

journal homepage: [www.elsevier.com/locate/eswa](http://www.elsevier.com/locate/eswa)

## A generalized line segmentation method for multi-script handwritten text documents

Payel Rakshit<sup>a,\*</sup>, Chayan Halder<sup>b</sup>, Md Obaidullah Sk<sup>c</sup>, Kaushik Roy<sup>d,e</sup>\*

<sup>a</sup> Department of Computer Science, Amrita School of Engineering, Kolkata 700 102, India

<sup>b</sup> Department of Computer Science, Ramakrishna Mission Vivekananda University, Beliaghata, Kolkata 700 118, WB, India

<sup>c</sup> Department of Computer Science and Engineering, Aliah University, Kolkata 700 156, WB, India

<sup>d</sup> Department of Computer Science, West Bengal State University, Kolkata 700 126, WB, India

### ARTICLE INFO

**Keywords:**  
 Unconstrained handwriting  
 Light projection  
 Joint point detection  
 Boundary tracking  
 Text line segmentation  
 Filling and smoothing

### ABSTRACT

Handwritten document image segmentation into text-lines is a crucial stage towards unconstrained handwritten document recognition. In the context of Indian subcontinent various scripts are used for communication where a system for multi-script handwritten text line segmentation is very much essential. This paper presents a multi-script text line segmentation algorithm based on newly developed light projection, start joint detection, and boundary tracking methods. The proposed approach is able to handle the challenges of Indian scripts faced by state-of-the-art methods. The experiments are performed on our proposed multi-script handwritten document image dataset WISLBDH\_text and also on a variety of well-known public handwritten datasets namely: CMATERAH, PhMeDiD\_11, KHATT, HIT-MW, ISI Bengal Writer identification/Verification dataset, ICdar 2013 segmentation contest dataset, ICDAR 2013 writer identification contest benchmark dataset, and obtained promising results.

### 1. Introduction

Text Line Segmentation is not only one of the most crucial pre-processing steps of OCR but also essential for tasks like the alignment of text/image, extraction of specific fields, word spotting (*Jamuna & Hariharan, 2013*), handwriting analysis (*Halder et al., 2018; Mukherjee et al., 2019; Vidyash & Agarwal, 2021*), etc. Some of the systems follow analytic approach where the unit of recognition is character and for such systems line segmentation is an immensely important stage that needs to be followed. ‘Line’ is a basic entity of text document image and segmentation of line is treated as one of the most significant tasks of handwritten OCR. Thus, it is very clear that line segmentation is an unavoidable step for document image processing. Text line segmentation of machine printed documents is quite a solved problem but there is still a need for it for handwritten documents. Due to the wide variations of handwritten text make the segmentation task more challenging. The major difficulties include high variation in writing styles, irregular line gap, skew angle between text lines, variable character size, and overlapping or touching lines. In different languages (e.g. Arabic, Greek, French, Bangla, Urdu, etc.), plethora of accents make their presence frequently, this irregular and diverse nature of line segmentation. To top it all, this irregular and diverse nature of

handwritten documents are dependent on writers which increases the level of difficulty to a great extent. Many researchers have put their contribution to solve this problem of text line segmentation in freight environment (*Ulfarsson-Salem & Faure, 1994; Rakshit et al., 2018*). There are already some conventional approaches like projection profile (*Rakshit & Pal, 2020*), Hough transform (*Louloudis et al., 2009; Pu & Shi, 1999*), Smearing and grouping of components etc. (*Gatos et al., 2007; Shi & Govindaraju, 2004*); but these methods become inadequate to handle all types of documents when they are applied individually. Sometimes the combination of some conventional methods show more effectiveness than an individual one which is quite evident in the literature (*Rakshit et al., 2018; Sanasam et al., 2020; Sarkar et al., 2009; Stamatopoulos et al., 2013*). In this work, an attempt has been made to towards an efficient yet less complex line segmentation system capable of handling diverse handwritten documents. Distinguishing of foreground and background pixel or text and non-text area is a very common step towards text line segmentation to make the task easier. In the proposed system, isolating the text and non-text regions of a document is done using a novel light projection method. It uses the properties of light where text components are considered as objects. Following the same properties, whenever light gets a text pixel as an obstacle in its path,

\* Corresponding author.

E-mail addresses: [pmyrlife20@gmail.com](mailto:pmyrlife20@gmail.com) (P. Rakshit), [chayan.halder@gmail.com](mailto:chayan.halder@gmail.com) (C. Halder), [sk.obaidullah@gmail.com](mailto:sk.obaidullah@gmail.com) (M.O. Sk), [kaushik.mrj@gmail.com](mailto:kaushik.mrj@gmail.com) (K. Roy).

<https://doi.org/10.1016/j.eswa.2022.118498>

Received 5 March 2021; Received in revised form 25 October 2021; Accepted 8 August 2022

Available online 23 August 2022

© 2022 Elsevier Ltd. All rights reserved.

Acta Applicandae Mathematicae (2024) 191:5  
https://doi.org/10.1007/s10440-024-00654-1

# Comprehensive Analysis of Deterministic and Stochastic Eco-Epidemic Models Incorporating Fear, Refuge, Supplementary Resources, and Selective Predation Effects

Sasanka Shekhar Maity<sup>1</sup> · Pankaj Kumar Tiwari<sup>2</sup> · Samares Pal<sup>1</sup>

Received: 24 October 2023 / Accepted: 29 April 2024

© The Author(s), under exclusive licence to Springer Nature B.V. 2024

## Abstract

In this investigation, we delve into the dynamics of an eco-epidemic model, considering the intertwined influences of fear, refuge-seeking behavior, and alternative food sources for predators with selective predation. We extend our model to incorporate the impact of fluctuating environmental noise on system dynamics. The deterministic model undergoes thorough scrutiny to ensure the positivity and boundedness of solutions, with equilibria derived and their stability properties meticulously examined. Furthermore, we explore the potential for Hopf bifurcation within the system dynamics. In the stochastic counterpart, we prioritize discussions on the existence of a globally positive solution. Through simulations, we unveil the stabilizing effect of the fear factor on susceptible prey reproduction, juxtaposed against the destabilizing roles of prey refuge behavior and disease prevalence intensity. Notably, when disease prevalence intensity is too low, the infection can be eradicated from the ecosystem. Our deterministic analysis reveals a complex interplay of factors: the system destabilizes initially but then stabilizes as the fear factor suppressing disease prevalence intensifies, or as predators exhibit a stronger preference for infected prey over susceptible ones, or as predators are provided with more alternative food sources. Moreover, for the stochastic system, the oscillations tend to cluster around the coexistence equilibrium of the corresponding deterministic model when white noise intensity is low. However, with increasing white noise intensity, oscillation amplitudes escalate. Critically, very high levels of white noise can lead to the eradication of infection from the ecosystem.

**Keywords** Eco-epidemic model · Fear effect · Prey refuge · Additional foods · Selectivity · Stochasticity

## 1 Introduction

Research scientists have extensively utilized mathematical models to explore epidemiological and ecological systems [1–6]. Various predator-prey models have been examined, focus-

S. Pal  
samaresp@yahoo.co.in

<sup>1</sup> Department of Mathematics, University of Kalyani, Kalyani, 741235, India

<sup>2</sup> Department of Basic Science and Humanities, Indian Institute of Information Technology, Bhagalpur, 813210, India

Published online: 14 May 2024

Springer

Innovations in Systems and Software Engineering  
https://doi.org/10.1007/s11334-024-00588-9

ORIGINAL ARTICLE

## Optimization of time-dependent MORRAP for series–parallel system using improved NSGA-II in interval environment

Satyajit De<sup>1</sup>

Received: 21 August 2024 / Accepted: 7 October 2024

© The Author(s), under exclusive licence to Springer-Verlag London Ltd., part of Springer Nature 2024

### Abstract

This research proposes a novel time-dependent interval-valued function-based multi-objective reliability redundancy allocation problem (TIVF-MORRAP) focused on multi-stage series–parallel systems. Time is a critical factor in assessing system reliability and cost. The novel contribution of this study is the use of an interval-valued function (IVF) approach to manage uncertainties in component reliability, cost, and repair costs, with time as a key variable. The objective is to boost system reliability and minimize costs over time by efficiently allocating redundant components at each stage. The process ensures a restricted allocation of duplicates across all stages and the entire system. In this problem the reduction in component reliability and cost are modeled by the varying radius length along the inverse logarithmic spiral over time. Likewise, the escalation in component repair costs is depicted by the logarithmic spiral. In this study, NSGA-II-AGDV is introduced, a multi-objective evolutionary algorithm (MOEA) that combines NSGA-II (Non-dominated Sorting Genetic Algorithm-II) with agglomerative and divisive clustering algorithms and the Topsis method to solve the problem. Unlike NSGA-II, which utilizes crowding distance, many researchers have adopted a single clustering technique to improve diversity and limit the solution set size. The proposed algorithm integrates two clustering techniques, enhancing functionality while also reducing execution time. A benchmark problem verifies the proposed method, showing enhanced performance and better convergence to true Pareto optimal solutions compared to NSGA-II and NSGA-II with crowding distance elimination (NSGA-II-CDE) across various time values.

**Keywords** Reliability redundancy allocation model · Spiral model · Interval-valued function · Non-dominated sorting · Agglomerative clustering · Divisive clustering

### 1 Introduction

In a multi-stage series–parallel reliability redundancy allocation Model (RRAM), improving reliability involves consistently allocating redundant components across each stage, using similar components when feasible, and optimizing resource use across stages [1]. This study utilizes a  $n$ -stage series–parallel framework, following the model proposed by De et al. [2]. Within this setup, each of the  $n$  stages is connected in series, with the  $i^{th}$  stage containing  $x_i$  components in parallel, where  $1 \leq x_i \leq E$ . Of these components, one serves as the primary, while the others ( $x_i - 1$ ) serve as

redundant backups, with  $E$  denoting the maximum permissible components per stage.

To address the outlined model, TIVF-MORRAP is introduced. The primary aims of this problem are to maximize system reliability while minimizing both system cost and system repair costs. The problem is constrained by a limit on the allowable number of components per stage, as well as the total number of components across the entire system. The main goal of this research aims to optimize the placement of redundant components at every stage, ensuring that the stated objectives are met while adhering to the specified constraints on time. To enhance realism and flexibility in TIVF-MORRAP, uncertainties in component reliability and costs are managed through the utilization of IVF, as suggested by Roy et al. [3]. Time plays a crucial role in assessing the system's reliability and cost. Typically, component reliability and cost tend to decrease, while component repair costs increase by a certain factor relative to their previous

Satyajit De  
satyajitde93@gmail.com

<sup>1</sup> Department of Computer Science, Maheshtala College, B.B.T Road, Kolkata, West Bengal 700139, India

Published online: 22 October 2024

Springer