

Dhruboraj Roy

Civil Engineering Graduate | Researcher | ICCR Scholar | YouTube Tutor

☎ (+88) 01705-927257 ✉ Dhruborajroy3@gmail.com ✉ Dhrubo.bec.ce04@gmail.com

🌐 thedhrubo.xyz 🌐 linkedin.com/in/dhruboraj-roy 📺 Dhrubo Raj Roy

🆔 ORCID: 0009-0007-9447-2154 📄 github.com/dhruborajroy 📍 Lalmonirhat, Rangpur, Bangladesh

Personal Statement

Civil Engineering undergraduate at Barishal Engineering College (Faculty of Engineering and Technology, University of Dhaka) with a strong passion for research in hydrology, flood modeling, and sustainable water resource management. An ICCR Suborna Jayanti Scholar with a consistent academic record (CGPA 3.40/4.00), I bring a rare combination of structural and environmental engineering expertise alongside hands-on programming skills in PHP, JavaScript, and MySQL. Aspiring to pursue graduate studies (M.Sc./M.Engg./Ph.D.) where I can contribute to impactful research at the intersection of civil engineering and data-driven technology.

Education

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| Bachelor of Science (Engg.) in Civil Engineering
<i>Barishal Engineering College – Affiliated with University of Dhaka</i> | Barishal, Bangladesh
2022 – Present |
| <ul style="list-style-type: none">• CGPA: 3.40 / 4.00• Relevant Coursework: Structural Analysis & Design, Geotechnical Engineering, Hydrology & Water Resources, Environmental Engineering, Transportation Engineering, Fluid Mechanics, Surveying & Construction Technology | |
| Higher Secondary Certificate (HSC) – Science
<i>Police Lines School & College, Rangpur</i> | Rangpur, Bangladesh
2018 – 2020 |
| <ul style="list-style-type: none">• GPA: 5.00 / 5.00 | |
| Secondary School Certificate (SSC) – Science
<i>Lalmonirhat Government High School</i> | Lalmonirhat, Bangladesh
2016 – 2018 |
| <ul style="list-style-type: none">• GPA: 5.00 / 5.00 | |

Research Interests

- Hydrology & Flood Modeling
- Climate Change Impact on Water Resources
- Water Resource Management
- Structural & Earthquake Engineering
- GIS Applications in Civil Engineering
- Environmental Engineering

Scholarships & Awards

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|--|-------------------------------------|
| ICCR Suborna Jayanti Scholarship (SJS)
<i>Indian Council for Cultural Relations (ICCR), Government of India NIT Patna</i> | Patna, Bihar, India
Jun 2022 |
| <ul style="list-style-type: none">• Selected as an international student under the prestigious ICCR Suborna Jayanti Scholarship (SJS) to pursue B.Tech in Civil Engineering at the National Institute of Technology (NIT) Patna for academic session 2022–23• Developed a strong foundation in structural, geotechnical, and environmental engineering; enhanced problem-solving and research capabilities in a globally diverse academic environment | |
| 2nd Place – Project Showcasing 2024
<i>Technical Competition, Research & Training Center, Barishal Engineering College</i> | Mar 2024 |
| <ul style="list-style-type: none">• Presented an innovative civil engineering project among peers, demonstrating strong analytical, problem-solving, and technical presentation skills | |
| 1st Place (Zila Level) – Science Fair 2017
<i>Lalmonirhat District Science Fair</i> | Lalmonirhat, Bangladesh
Jun 2017 |
| <ul style="list-style-type: none">• Developed mobile application “Krishan Bondhu” for agricultural assistance; won 1st place at district level• Selected and participated in Children Science Congress 2017 with the same project (December 2017) | |
| AutoCAD Training Course (3 Days)
<i>Barishal Engineering College</i> | Barishal, Bangladesh
Feb 2024 |

- Completed intensive 3-day AutoCAD training; gained hands-on experience in 2D drafting, engineering drawing, and design techniques for civil engineering applications

Board Scholarship – JSC

Rangpur, Bangladesh

Dinajpur Education Board

Dec 2015

- Awarded board-level scholarship for outstanding performance in Junior School Certificate examination

Publications & Research

B.Sc. Engineering Thesis

Barishal Engineering College, University of Dhaka | Co-authors: Dhruboraj Roy, Orin Karmaker, Md. Liton Rabbani

- **Title:** *Thermal Footprint of Industrial Development: Assessing Land Surface Temperature and Air Temperature Variations Around the Rampal Power Plant, Bangladesh Using Multi-Temporal Landsat-8 and Geospatial Techniques*
- **ORCID:** 0009-0007-9447-2154 **Institutional Email:** Dhruborajroy.duengg@bec.edu.bd
- Conducted a comprehensive spatio-temporal analysis of LST, LULC, NDVI, Air Temperature, and UHI intensity around the 1,320 MW Rampal Maitree Super Thermal Power Project, Bagerhat, using Landsat-8 imagery at biennial intervals (2014–2024)
- **Key Findings:** Max LST rose by 10°C (24.30 → 34.30°C); Bare/Industrial land tripled (9.2% → 27.1%); Mean NDVI declined 44% (0.41 → 0.23); Estimated peak air temperature reached 40.4°C in 2022; UHI intensity nearly doubled (4.5°C → 7.8°C)
- **Methods:** ArcGIS 10.8, ISODATA LULC Classification, Radiative Transfer Equation for LST, AL-Anbari et al. (2019) Air Temperature Regression ($T_a = a \cdot LST + b \cdot DEM + c \cdot DDL + d$), Getis-Ord G_i^* Hotspot Analysis, Pearson Correlation; OA >80%, Kappa >0.75
- Provides satellite-based empirical evidence of industrial thermal impact on the Sundarbans UNESCO World Heritage Site buffer zone and informs environmental policy for ecologically sensitive industrial siting

Journal Manuscript (Under Preparation)

Barishal Engineering College, University of Dhaka | Co-authors: Dhruboraj Roy, Orin Karmaker, Md. Liton Rabbani

- **Working Title:** *Spatio-Temporal Analysis of Land Surface Temperature and Air Temperature Dynamics Induced by the Rampal Thermal Power Plant Using Landsat-8 Imagery and GIS: Implications for the Sundarbans Ecosystem*
- Adapted from B.Sc. thesis as a peer-reviewed journal article analyzing post-commissioning thermal and land cover impacts of the Rampal Power Plant and their ecological implications for the Sundarbans mangrove ecosystem
- **Target Journals:** *Remote Sensing of Environment* | *Environmental Science & Pollution Research* | *Sustainable Cities and Society* (Q1/Q2 indexed)

Experience & Internship

Research Assistant

Barishal, Bangladesh

Barishal Engineering College | Part-time, On-site

Aug 2025 – Present

- Conducting independent research in environmental and geospatial analysis for southwest Bangladesh, integrating remote sensing and GIS to address climate and industrial impact problems
- **Thermal Footprint Study:** Analyzed Rampal Power Plant's thermal impact using multi-temporal Landsat-8 imagery; assessed LST and air temperature variations and spatial thermal anomaly patterns
- **Precipitation Trend Analysis:** Performed GIS-based analysis of long-term rainfall variability, seasonal patterns, and spatial distribution to support water resource planning in coastal Bangladesh
- **Tools:** Remote Sensing (Landsat-8), ArcGIS/QGIS, time-series & spatial analysis, data visualization and mapping

Public Works Department (PWD), Government of Bangladesh

Barishal, Bangladesh

Civil Engineering | Internship, On-site

Dec 2025 – Jan 2026

- Completed a 15-day internship at the Public Works Department (PWD), Barishal
- Gained practical exposure to government civil engineering projects, site supervision, and construction management practices

Graphic Design Training – Photoshop & AI Tools

Barishal, Bangladesh

ICT Division, Government of Bangladesh (EDGE Project) | Part-time, On-site

May 2024 – Jun 2024

- Completed professional training on Graphic Design using Photoshop and AI tools under the Government of Bangladesh's EDGE Project
- Developed skills in digital content creation, visual design, and AI-assisted creative workflows

Projects

- Barishal Engineering College Official Website & LMS** | *PHP, JavaScript, MySQL* Feb 2025 – Present
- Solely designed, developed, and deployed the official institutional website: bec.edu.bd
 - Built a full-featured **Learning Management System (LMS)** with three role-based portals — Faculty (</faculty/login>), Students (</students/login>), and Admin (</webadmin>)
 - Architected PHP/MySQL backend with role-based access control, academic record management, course content delivery, and institutional information management modules
 - Live production system in active use by the entire Barishal Engineering College community since February 2025
- Courier Fraud Check System** | *PHP, JSON API* | [GitHub](#) Jul 2025
- Built a smart fraud detection tool for courier services with PHP backend, JSON API, and responsive UI for real-time fraud tracking and verification
- Horizon – Multiline Certificate Generator** | *PHP* | [GitHub](#) Nov 2025
- Developed an automated bulk certificate generator for Horizon – Civil Engineers Forum enabling one-click generation and printing of event certificates
- BEC Hall Management System** | *PHP* | [GitHub](#) Nov 2025
- Designed and developed a residential hall management system for Barishal Engineering College with student allocation, record management, and admin modules
- QR-Based Digital Management System (ScanBite)** | *PHP, JavaScript, MySQL* | [GitHub](#) 2023 – 2024
- Built a full-stack web application featuring QR-code-based data entry, authentication, and record management
 - Designed normalized MySQL database schema and RESTful PHP backend; deployed on a live web server
- Flood Hazard Mapping & Hydrological Analysis** | *ArcGIS, QGIS* 2024
- Performed GIS-based spatial analysis to delineate flood-prone zones and quantify climate change impact on water flow
 - Analyzed hydrological data to support sustainable water resource management recommendations
- Structural Analysis of RC Buildings** | *AutoCAD, ETABS* 2023 – 2024
- Designed and analyzed reinforced concrete building frames under gravity and lateral (seismic/wind) loads using ETABS
 - Prepared detailed 2D/3D structural drawings and construction documents using AutoCAD per BNBC standards
- Krishan Bondhu – Agricultural Mobile Application** | *Mobile App Development* 2017
- Independently designed and developed a mobile app to assist farmers with crop management and agricultural guidance
 - Won 1st place at the Lalmonirhat District Science Fair and represented at the National Children Science Congress

Full project portfolio (54+ repositories): github.com/dhruborajroy

Technical Skills

Engineering Software: AutoCAD, ETABS, ArcGIS, QGIS

Programming & Web: PHP, JavaScript, MySQL, HTML, CSS, R

Operating Systems: Windows, macOS, Linux (Ubuntu, Kali, CentOS, Raspbian Buster)

Productivity & Design Tools: Microsoft Office Suite (Word, Excel, PowerPoint), \LaTeX , Adobe Photoshop, AI Design Tools

Engineering Domains: Structural Analysis & Design, Geotechnical Engineering, Hydrology & Water Resources, Environmental Engineering, Flood Modeling, Transportation Engineering

Soft Skills: Research & Development, Technical Writing, Anchoring & Presentation, Team Leadership, Problem Solving

Languages: Bengali (Native), English (Professional), Hindi (Conversational)

Leadership & Extracurricular Activities

Assistant Secretary – Research, Innovation & Publication Sub-Committee Barishal, Bangladesh
Horizon – Civil Engineers Forum, Barishal Engineering College Jan 2024 – Jan 2025

- Drove a research-oriented culture among Civil Engineering students through organized academic events and collaborative projects
- Coordinated academic publication efforts and assisted faculty in student-led research initiatives
- Organized technical seminars, workshops, and innovation showcases; skills: Leadership, Research Coordination, Event Management, Team Collaboration

Senior Tech Assistant Lalmonirhat, Bangladesh
Lalmonirhat Science and Literature Club 2020 – 2024

- Provided technical guidance and mentorship to junior members in science and technology projects
- Supported the club's STEM outreach initiatives in the Lalmonirhat district

Content Creator & Engineering Educator YouTube / Online
Dhrubo Raj Roy – YouTube Channel 2024 – Present

- Creating educational content on Civil Engineering concepts for university students covering Structural Analysis, Geotechnical Engineering, Hydrology, and Fluid Mechanics
- Bridges theoretical concepts with real-world engineering practice and research

References

Md. Liton Rabbani

Associate Professor & Supervisor, Department of Civil Engineering, Barishal Engineering College

- litonkce01@gmail.com | liton.duengg@bec.edu.bd | Tel: (+88) 018-32037220

Md. Tarek Hossain, PhD

Assistant Professor & Head, Department of General Science and Humanities, Barishal Engineering College

- tarekphysust@gmail.com | Tel: (+88) 017-2226657

I hereby certify that all information provided above is true and correct to the best of my knowledge.