Md. Aslam Hossain

Designation: Lecturer, Dept. of Mathematics, Pabna University of Science and Technology, Pabna-6600, Bangladesh.

Academic Degree: M.S. (Thesis) in Mathematics, B.S. (Honors) in Mathematics

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❖ ***Personal Profile and Research Experiences:***

I am a passionate mathematics faculty member and an active researcher with a strong specialization in Computational Fluid Dynamics, particularly in heat and mass transfer. My research interests focus on natural and magneto-hydrodynamic mixed convection and entropy generation in complex geometries, with a growing emphasis on integrating artificial intelligence and machine learning with CFD to address complex engineering phenomena. I have demonstrated research leadership as the Principal Investigator of multiple projects funded by the University Grants Commission of Bangladesh, investigating thermal performance in innovative cavity designs. My work is grounded in finite element modeling using COMSOL Multiphysics and has led to publications in reputable Q1 and Q2 ranked journals. Supported by a strong academic background, recognized research contributions, and teaching experience, I am highly motivated to pursue doctoral research aimed at advancing both theoretical insights and practical applications in mathematics and computational sciences.

❖ ***Educational Qualifications:***

➢ ***M.S. in Mathematics***

Institution: University of Barishal, Barishal-8254, Bangladesh.

Passing Year: 2017

GPA: 3.88 out of 4.00

Thesis Title: Effects of Natural Convection on 2D Incompressible Flow in a Non-inclined and an Inclined Square Cavity of Uniformly and Non-uniformly Heated Walls

Notable Courses: Fluid Dynamics, Magneto-hydrodynamics, Advanced Numerical Analysis, Dynamical Systems

Awards: Dean's Award-2017

Fellowships & Scholarships: 'NST Fellowship (2018-2019)', Ministry of Science and Technology, Bangladesh.

- ***B.S. (Honors) in Mathematics***

Institution: University of Barishal, Barishal-8254, Bangladesh.

Passing Year: 2016

CGPA: 3.94 out of 4.00

Project Title: A Review of Solution Techniques of Linear Fredholm Integral Equations of Second kind

Notable Courses: Calculus, Basic Statistics, Linear Algebra, Introduction to Probability, Real Analysis, Mathematical Statistics, Ordinary Differential Equations, Numerical Analysis, Complex Analysis, Mechanics, Abstract Algebra, Topology, Tensor Analysis, Mathematical Methods, Partial Differential Equations, Functional Analysis, Differential Geometry, Mathematical Modeling in Biology, Hydrodynamics

Awards:

- Dean's Award-2016
- 'Prime Minister Gold Medal-2018', University Grants Commission, Bangladesh.

Fellowships & Scholarships: 'University Grants Commission Merit Scholarship-2016', Ministry of Education, Bangladesh.

- ***Higher Secondary Certificate (H.S.C.)***

Institution: Govt. Syed Hatem Ali College, Barishal, Bangladesh.

Passing Year: 2012

GPA: 5.00 out of 5.00

Group: Science

- ***Secondary School Certificate (S.S.C.)***

Institution: Hijaltala Moulavir Hat Secondary School, Barishal, Bangladesh.

Passing Year: 2010

GPA: 5.00 out of 5.00

Group: Science

❖ ***Research Interests:***

- Computational Fluid Dynamics
- Heat and Mass Transfer
- Integral Equations
- Numerical Analysis

- Mathematical Biology
- Non-linear Dynamics

❖ ***Publications:***

1. Sadia Islam, Md. Nur Alam, **Md. Aslam Hossain**, M.K.A. Mitta, S.F. Ahmed, Finite Element Analysis of Natural Convection and Entropy Generation in a T-Shaped Cavity with an Octagonal Block, Journal of Taibah University for Science, Vol. 19 (2025) (Indexed: IF: 4.10; Cite Score: 5.5; Q1 Journal; SCOPUS; SCI-E; Publisher: Taylor & Francis). DOI: https://doi.org/10.1080/16583655.2025.2573594
2. Sadia Islam, Md. Nur Alam, **Md. Aslam Hossain**, Mst. Kakoly Akter Mita, Shams Forruque Ahmed, MHD mixed convection and entropy generation inside a square wavy cavity with a cone heater, International Communications in Heat and Mass Transfer (2025) 109734, (Elsevier Publisher, Q1, CS: 10.1, IF: 6.4), DOI: https://doi.org/10.1016/j.icheatmasstransfer.2025.109734
3. Reaz Hossain, Md. Sagib, **Md. Aslam Hossain**, S. M. Rayhanul Islam, Soliton Solutions, Bifurcation, Sensitivity and Chaotic Analysis of the nonlinear Combined Kairat-II-X wave model, Physics Letters A (2025), (Elsevier Publisher, Q2, CS: 4.5, IF: 2.6), DOI: https://doi.org/10.1016/j.physleta.2025.131010
4. **Md. Aslam Hossain**, Md. Rafiqul Islam, Md. Nur Alam, Md. Sagib, M.A.H. Sajib, Chinmayee Podder, Bijan Krishna Saha, Md. Jakir Hossen, Impacts of nanoparticle shape and periodic heating on entropy generation inside a tilted nanofluid filled rectangular cavity, International Journal of Thermofluids (2025), DOI: https://doi.org/10.1016/j.ijft.2025.101424 (Elsevier Publisher, Q1. CS:9.6)
5. Rafiqul Islam , **Aslam Hossain** , Rajib Biswas , Mehedy Hasan , B. M. Jewel Rana , Habibullah Habibullah & Mohammad Afikuzzaman, Modelling and theoretical overview of Casson fluid flow through a stretching sheet with variable viscosity and sinusoidal boundary conditions, INTERNATIONAL JOURNAL OF AMBIENT ENERGY (2025), VOL. 46, NO. 1, 2539139, DOI: https://doi.org/10.1080/01430750.2025.2539139 (CS: 6.3, Q2)
6. Bijan Krishna Saha, Goutam Barai, Nithan Majumdar, **Md. Aslam Hossain**, Goutam Saha, and Suvash C. Saha, Thermal performance enhancement in a hexagonal cavity filled with hybrid nanofluid and a steering-shaped insertion, Front. Energy Res (2025). 13:1602241. doi: https://doi.org/10.3389/fenrg.2025.1602241 (IF: 2.4, CS: 5, Q2)
7. **Md. Aslam Hossain** , M.A.H. Sajib , Md. Sagib , Md. Rafiqul Islam , Goutam Barai , Chinmayee Podder , Bijan Krishna Saha , Enhanced thermal efficiency on mixed

convection flow of TiO2 – water nanofluid inside a double lid driven zigzag cavity with and without heated obstacles insertion, International Journal of Thermofluids (2025), doi: https://doi.org/10.1016/j.ijft.2024.101040 (Q1, CS: 10.1, IS: 8.98)

8. Md. Sagib, **Md. Aslam Hossain**, Bijan Krishna Saha, Kamruzzaman Khan, On traveling wave solutions with stability and phase plane analysis for the modified Benjamin-Bona-Mahony equation, PloS ONE 19(7) (2024), (Q1, IF: 2.9)

❖ ***Submitted Papers:***

1. **Md. Aslam Hossain,** Md. Nur Alam, Shams Forruque Ahmed, Tanmoy Bairagi, and Md. Rafiquzzaman Rafi, 'Artificial intelligence-predicted heat transfer and entropy generation with heat line visualization inside a nanofluid-filled wavy T-shaped cavity with obstacle insertion'.
2. Rukaya Parven, Sadia Islam, Ashikur Rahman, **Md. Aslam Hossain** and Md. Nur Alam, 'Numerical Analysis for the Impacts of an Embedded Circular Heat Source on Entropy Generation Inside a Rectangular Cavity'
3. Sadia Islam, Muhammad Ziaul Haque, **Md. Aslam Hossain**, 'Entropy Generation Optimization Inside a Nanofluid Filled Truncated Prismatic Cone With a Rotating Cylinder Due to MHD Mixed Convection Heat Transfer'

❖ ***Active Research Project:***

- PUST Project [2025-2026] funded by University Grants Commission, Bangladesh.: Title: "Optimization of MHD mixed convection heat transfer with entropy generation and heatline visualization inside a nanofluid filled novel double lid driven heart shaped cavity with ring shaped heat source using FEM along with AI prediction." Position in the Project: Principal Investigator, Project Value: 450,000 TK

❖ ***Previous Research Project:***

- PUST Project [2024-2025] funded by University Grants Commission, Bangladesh.: Title: "Finite element analysis of entropy generation due to mixed convective flow of Aluminium Oxide-water nanofluid inside a vented cavity." Position in the Project: Principal Investigator, Project Value: 190,000 TK
- PUST Project [2023-2024] funded by University Grants Commission, Bangladesh.: Title- "Entropy generation during natural convective flow of Titanium Oxide-water nanofluid inside an inclined rectangular cavity: Non-uniform Heating Case." Position in the Project: Principal Investigator, Project Value: 200,000 TK

❖ ***Post Graduate Supervision:***

1. Session: 2021-2022; Title: Finite element analysis of entropy generation and heat transfer in complex cavities with internal obstacles under natural and MHD mixed convection. (as Co-Supervisor)

❖ ***Graduate Supervision:***

1. Session: 2018-2019; Title: Impacts of cylindrical obstacles at different locations on natural convection fluid flow inside a wavy rectangular cavity having uniformly heated wall.
2. Session: 2018-2019; Title: Impacts of rectangular obstacles at different locations on natural convection fluid flow inside a wavy square cavity having periodically heated wall.
3. Session: 2017-2018; Title: Heat transfer analysis inside a square cavity containing rectangular block due to natural convective flow of air.
4. Session: 2017-2018; Title: The Elementary of Number Theory.
5. Session: 2016-2017; Title: Heat transfer analysis inside a rectangular enclosure containing circular block due to natural convective flow of air.
6. Session: 2014-2015; Title: A comparative study of different methods to solve integral equations.

❖ ***Workshop, Seminar and Webinar:***

- A workshop on "Effective Teaching & Professional Development" organized by BAF Shaheen College, Kurmitola on the date of 03-05 January, 2021
- A webinar on "Mathematics and its Applications" organized by Department of Mathematics, Chittagong University of Engineering and Technology in collaboration with Bangladesh Mathematical Society on the date of 03th October, 2020.
- A workshop on "Effective Teaching & Professional Skill" organized by BAF Shaheen College, Kurmitola on the date of 18-19 March, 2020
- A workshop on " Teacher Orientation Programme-01" organized by BAF Shaheen College, Dhaka on the date of 02-04 December, 2019
- A workshop as a keynote speaker on "10^{th} National Undergraduate Mathematics Olympiad" organized by Department of Mathematics, University of Barishal.
- A seminar on "20^{th} International Mathematics Conference 2017" organized by Department of Mathematics, University of Dhaka on the date of 08-10 December 2017.

- ***Professional Training:***
  - A four months long Professional Development Training for University Faculty Under HEAT Project from 13th October, 2025 to 12th February, 2026.
- ***Notable Conducted Courses:*** Geometry of Two Dimensions, Linear Algebra, Discrete Mathematics and Graph Theory, Complex Analysis, Mechanics, Ring Theory, Number Theory, Fluid Dynamics
- ***Computer Skills:***
  - **Operating System**: Windows98/ 2000/ XP/ Windows 7/ Windows 8 & Windows 10.
  - **Application Software:** MS-Office2003; 2007; 2010 (Word, Excel, Access Power Point), Internet Explorer.
- ***Programming Language:*** Python, R, MATLAB, FORTRAN
- ***Learned Software:*** COMSOL Multiphysics, Mathematica, MAXQDA, Maple
- ***Honors & Awards:***
  - Champion at the regional (Khulna) round of '9th National Undergraduate Mathematics Olympiad'.
  - Second Runners Up at the regional (Khulna) round of '8th National Undergraduate Mathematics Olympiad'.
  - Second runners up at the final round of '8th National Undergraduate Mathematics Olympiad'.
- ***Professional Membership:***
  - BMS: Bangladesh Mathematical Society
- ***Language Skills:***
  - Bengali (Fluent in speaking, listening, reading and writing)
  - English (Fluent in speaking, listening, reading and writing)
- ***Teaching Experiences:***
  - Lecturer in Mathematics at "Pabna University of Science & Technology, Pabna-6600" from 17, October 2022 to present.
  - Lecturer at "BAF Shaheen College, Dhaka" from 10, December 2019 to 16, October 2022.
  - Assistant Teacher at "BAF Shaheen College, Dhaka" from 21, November 2019 to 09, December 2019

- Assistant Teacher at " Jagadish Sarswata Girls School & College, Barishal" from November, 2016 to February, 2017.
- Lecturer at " S@ifurs Admission Coaching, Barishal" from June, 2016 to October, 2016
- Assistant Teacher at “Nandonik Academy”, Barishal from February, 2013 to January, 2018.

❖ ***Administrative Experiences:***

- Assistant Director, Office of the Student Advisor, PUST from 10 October 2024 to present.

❖ ***References:***

1. **Professor Dr. Md. Fazlul Hoque**

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   Associate Professor

   Dept. of Mathematics, University of Barishal

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3. **Chinmayee Podder**

   Associate Professor

   Dept. of Mathematics, University of Barishal

   Cell phone: +8801816-298577

   E-mail:chinmayeepodder1@gmail.com

❖ ***Declaration:***

I hereby certify that all the information provided is true in best of my knowledge and sense and well supported by legal documents.

(Md. Aslam Hossain)