

# Titu Nath

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## Education

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- Khulna University of Engineering & Technology (KUET)** **Khulna, Bangladesh**
    - Bachelor of Science (B.Sc.) in Mechanical Engineering; CGPA: 3.65/4.00 **Merit Position: 20th**  
January, 2020 - September, 2025 (Out of 139 Students)
    - **Thesis:** Investigating Hemodynamic Changes in Bifurcated Arteries with Varying Eccentricity Using Nanofluid Simulation
    - **Synopsis:** Conducted a parametric ANSYS Fluent study on a 3D LMCA bifurcation to quantify how stenosis eccentricity and Iron-Oxide nanofluid alter pulsatile blood hemodynamics (velocity, pressure, WSS and temperature). Implemented Carreau–Yasuda non-Newtonian rheology and an Eulerian multiphase model (implicit volume fraction); results showed nanofluids increase peak velocity, moderate low-shear zones and improve thermal distribution.

## Work Experience

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- **Research Assistant(RA)** September, 2025–Present
  - Under Dr. Mohammad Mashud, Professor of the Department of Mechanical Engineering, KUET, Khulna-9203, Bangladesh
    - **Role:** Working with the supervisor in the Aerodynamics and CFD Lab on aerodynamics and nanofluid research projects. Assisting in preliminary research, drafting, data visualization and documentation.

## Research Interests

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- Computational Fluid Dynamics • Bio-Engineering • Multiphase Flow • Aerodynamics • Bio Materials and Composite
  - Cardiovascular Fluid Mechanics • Nano-Materials • Machine Learning • Thermal Management

## Publications

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- Shuvo, S.P., Shibazee S.P., Das, C., **Nath, T.**, Islam, M.A., Aiatullah, Oishi, A.B., Biswas, S., Malakar, K. "Deep Neural Network Augmented by Non-Negative Matrix Factorization: A Unified Approach to Rainfall Prediction", In 2025 International Conference on Quantum Photonics, Artificial Intelligence and Networking (QPAIN). DOI: 10.1109/QPAIN66474.2025.11172109. (Published)
  - **Nath, T.**, Washi, A.T., Tahmid, K.M.T., Das, K.K., Das, J.P., Anto, T.H. " Investigating Hemodynamic Changes in a Stenosed Artery with Varying Eccentricity Using Nano-fluid Simulation", The 3rd International Conference on Mechanical Engineering and Applied Sciences 2025 (ICMEAS 2025). (Accepted)
  - Das, K.K., **Nath, T.**, Washi, A.T., Tahmid, K.M.T. " Comparative Study Between NACA 2412 and NACA 4412: A CFD Approach", The 3rd International Conference on Mechanical Engineering and Applied Sciences 2025 (ICMEAS 2025). (Accepted)
  - Tahmid, K.M.T., Das, J.P., **Nath, T.**, Das, K.K., Washi, A.T., Mahmud, S. " Numerical Investigation of Heat Transfer Performance in a Shell and Tube Heat Exchanger Using Twisted Tube and Hybrid Nano-Fluid", The 3rd International Conference on Mechanical Engineering and Applied Sciences 2025(ICMEAS 2025). (Accepted)
  - **Nath, T.**, Mashud, M., Roy, S. "Magnetohydrodynamic Effects on Hemodynamics in Left Main Coronary Bifurcated Artery: A Parametric Study of Stenosis Severity, Eccentricity and Bifurcation Angle." (Manuscript in Preparation)
  - **Nath, T.**, Mashud, M. "Investigating Hemodynamic Changes in Bifurcated Arteries with Varying Eccentricity & Stenosis Using Nanofluid Simulation." (Manuscript in Preparation)
  - **Nath, T.**, Mashud, M. "Numerical Investigation on the Flow Separation Control of NACA 0015 Airfoil by Tangential Blowing." (Manuscript in Preparation)
  - Roy, D., Roy, D., **Nath, T.**, Debnath, A.K., Hasib, M.A. "Effect of SiC Nanoparticle Content on the Mechanical and Physical Properties of Aluminum-Laminated Basalt-Nylon Hybrid Composites." (Manuscript in Preparation)
  - Zahid, I.I., **Nath, T.**, Sur, N., Debnath, A.K., Hasib, M.A. "Effect of Metal Oxide Nanofillers on the Physico-Mechanical Properties of Kenaf-Carbon Fiber Epoxy Hybrid Composites." (Manuscript in Preparation)
  - Sur, N., **Nath, T.**, Zahid, I.I., Saleheen M.F., Roy, D., Debnath, A.K., Hasib, M.A. "Enhancing Mechanical and Physical Properties of Jute/JUCO/Glass Fiber Hybrid Composites through Titanium-Oxide and Copper-Oxide Nanoparticle Reinforcement." (Manuscript in Preparation)

## Undergrad Projects

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- **Construction and Performance Test of a Thermoelectric Refrigerator using Peltier Effect.** 2024  
In my third academic year project, I have designed and constructed a thermoelectric refrigerator using the Peltier effect and tested the performance of this refrigerator.
  - **Design and Construction of a Formula Student Internal Combustion Car.** (2021-2025)  
Designed and manufactured the mechanical and fuel-cooling system, composite body and aerodynamics. Participated in Formula Student UK and Formula SAE Japan(on-site) and successfully passed Technical Inspection.

## Research In Progress

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- **Computational Analysis of Two Different Flow Diverting Stent Designs under Physiological Conditions: A Degradation Study at Different Stages and Conditions Post-Implantation.** (2025-Ongoing)  
Evaluating two PCL bioabsorbable flow-diverters, showing >1-year radial support, maintaining safe hemodynamics, exhibiting nonlinear degradation, experiencing surface erosion and demonstrating performance superior to PLLA.
  - **Investigating the Impact of Nano-Fillers on Mechanical and Physical Properties of Basalt-Jute Fiber Reinforced Epoxy Composites.** (2024-Ongoing)  
Investigating basalt–jute epoxy hybrid composites reinforced with Aluminium-Oxide and Magnesium-Oxide nanoparticles. Evaluating mechanical, physical, moisture resistance and SEM-based morphological behavior.

## Skill Summary

- Languages: C, MATLAB, Python
- CAD Tools: SolidWorks, AutoCAD
- CAE Tools: Ansys Fluent, COMSOL Multiphysics, Ansys Static Structural
- Documentation & Data Analysis: Microsoft Office, LaTeX, Tecplot, OriginPro
- Soft Skills: Leadership, Photography, Project Management, Time Management, Work Ethic

## Professional and Leadership Experience

- **Sector Co-Lead | Kilo Flight (Formula Student Team)** 2024-2025
  - Oversaw a team of 40 engineering undergrads working in two different technical sectors
  - Executed successful participation in the Formula SAE competition in Japan with a team of 20 members
- **Chief Executive Officer | LOOP (Control Engineering Club)** 2024-2025
  - Organized 6-day-long workshops on Programming and Introduction to Robotics for 80+ attendees
  - Instructor for classes on basic programmings and robotics
- **Co-Ordinator | KRIoTIC (KUET Robotics and IoT Innovation Club)** 2023-2024
  - Helped to organize 8-day-long workshops on Workshop on Robotics and Basic Hardware 2.0 for 120+ attendees
  - Presented on IoT innovation on behalf of the club at an inter-university program
- **President | KUETPS (KUET Photographic Society)** 2024-2025
  - Led a 70+ committee member; organized intra-inter university photography contests, photowalks and workshops
  - Worked with the university's professional team to supply curated contents for KUET's new official website
- **President | SSWAK (Sanatani Students' Welfare Association of KUET)** 2024-2025
  - Led 100+ committee, organizing rituals, festivals, seminars, puja, cultural programs, tours for 700+ members
  - Supported members by communicating needs and facilitating financial or other assistance from the association
- **Treasurer | DREAM (Voluntary Blood Donation Society of KUET)** 2024-2025
  - Earned Best Volunteer for blood management, emergency coordination, donor-recipient support and awareness
  - Organized blood drives; led committee, conducted blood-group testing at rural areas across districts
- **Vice President | CAK (Chittagong Association of KUET)** 2024-2025
  - Assisted a 100+ member association, coordinating cultural events and supporting students during admission
- **Floor Monitoring Committee Member | SSH (Shaheed Smriti Hall)** 2024-2025
  - Coordinated between students and authority to resolve issues and supported event organization within the hall
- **Volunteer | Ignition (A National Mechanical Festival)** 2023
  - Supported event operations for 500+ participants across 9 technical competitions from universities nationwide
- **Volunteer | TRY (A Non-profit Voluntary Organization Of KUETians)** 2020
  - Served as a volunteer helping KUETians and supporting rural welfare through medical, educational aid

## Awards and Achievements

- **Dean's Award: 2 times** 2024-2025
  - The Dean's Award is given to students having a CGPA of 3.75 or above in one academic year.
- **FS Class | Formula SAE Japan (FSAEJ)** 2023
  - Passed "Mechanical Inspection", Position (2023): Overall 32th/77; Cost-29/77, Design-30/77, BPP-32/77.
- **Technical Scholarship | Merit-Based Scholarship Recipient: 4 times** 2021-2024
  - Recognition reflects sustained academic excellence and consistently high departmental ranking.
- **Best Co-Organizer | Dream Volunteer Leadership Team** 2024
  - Awarded by DREAM (Voluntary Blood Donation Society of KUET) for leadership as Treasurer.
- **1st Runner Up | Diversity Season 5; Photography Exhibition** 2023
  - Selected among the top three at KUETPS intra-KUET exhibition: 21 finalists chosen from 630 submissions.
- **2nd Runner Up | Robotics Quiz** 2022
  - 3rd among 120 in Robotic Quiz-2020 held after LOOP's "Programming and Introduction to Robotics" workshop
- **Best Volunteer Award | Volunteer Excellence** 2022
  - Sole recipient (out of 60) from 2k19 of volunteer award for blood donation, managing, emergency coordination, training and campaigning.

## Certifications

- Certified Solidworks Associate (CSWA)-Mechanical Design, Dassault Systèmes 2025
- Introduction to COMSOL Multiphysics-AICHE Student Chapter (BUET) 2025
- Getting Started with Microsoft Excel-Coursera 2025
- Co-Curricular Excellence-Students' Welfare Center-KUET 2025
- Introduction to Autocad-Enhancing Digital Government and Economy Project 2025
- Safe Blood Transfusion Training-Khulna Medical College Hospital 2024
- Introduction to CFD-IMEchE Student KUET Chapter 2024

## References

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- **Dr. Md. Ashraful Islam**  
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