Department of Mechanical Engineering
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Arup Kumar Debnath
Assistant Professor
Research Area Fatigue and Fracture Mechanics Composite material

Biography

I am **Arup Kumar Debnath**, an Assistant Professor in the Mechanical Engineering Department at Khulna University of Engineering & Technology (KUET). I completed my BSc in Mechanical Engineering from KUET with a CGPA of 3.91, securing the first position in my class. I also completed my MSc in Mechanical Engineering at KUET, achieving a perfect CGPA of 4.00 out of 4.00, with my research focused on geopolymer composites.

I have a strong academic background and have received numerous awards and accolades for my outstanding performance. As an Assistant Professor at KUET, I have taught several courses, including Solid Mechanics, Machine Design, and Automobile Engineering.

Currently, I am involved in a UGC-funded project titled "Comparative Analysis of Alkali Treatment on Interfacial and Mechanical Properties of Kenaf-Carbon Fiber Reinforced Epoxy Composites." My research interests lie in material mechanics and composite materials, and I am committed to advancing these fields. I am also a PhD aspirant, looking to pursue a doctorate in Mechanical Engineering or Material Science.

In my leisure time, I enjoy traveling and exploring new places, as well as playing table tennis. I believe that having hobbies and interests outside of work and academics is important for maintaining a healthy work-life balance.

For more information, visit my personal website: [Portfolio | Arup Kumar Debnath (arupkuet.wixsite.com)]

Education

Masters of Science in Mechanical Engieering
Khulna University of Engineering & Tecnology,Bangladesh(July 2021-March 2024)
Thesis Title: Effect of Elevated Temperature on Behavior of Carbon and Kevlar Fiber Reinforced Geopolymer Composites
Bachelor of Science in Mechanical Engineering
Khulna University of Engineering & Tecnology,Bangladesh(2016-2021)
Thesis Title: Investigation of Mechanical Properties of Timber Beam Reinforced With FRC
Higher Secondary Certificate
Satkhira Govt. College,Bangladesh(2013-2015)
Secondary School Certificate
Satkhira Govt. High School,Bangladesh(2011-2013)

Service Records

- **Assistant Professor**
  Department/Section: Department of Mechanical Engineering
  Khulna University of Engineering & Technology *From 24-06-2024 to 01-01-1970*
- **Lecturer**
  Department/Section: Department of Mechanical Engineering
  Khulna University of Engineering & Technology *From 01-02-2022 to 23-06-2024*

Research Interest

Fatigue and Fracture Mechanics

Composite material
Comparative Analysis of Alkali Treatment on Interfacial and Mechanical Properties of Kenaf-Carbon Fiber Reinforced Epoxy Composites

The objective of this project is to develop and optimize hybrid composite materials that integrate chemically treated kenaf fibers with carbon fibers in an epoxy matrix. The specific objectives are:
i. To chemically treat kenaf fibers using sodium hydroxide, sulfuric acid, and lead oxide to improve their surface properties for better adhesion with the epoxy matrix.
ii. To manufacture hybrid composites by combining treated kenaf fibers with carbon fibers, using an epoxy resin as the matrix material.
iii. To investigate the physical, mechanical, and surface morphology of the manufactured hybrid composites.
iv. To compare the physical and mechanical properties of the fabricated composites.

Publication

Books

Journals

1. A. K. Debnath, R. Mustak and M. A. Hasib, "Investigation of Mechanical Properties of Timber Beam Reinforced with Glass Fiber," ***Journal of Engineering and Technology (JET)*** , ISBN:2180-3811, vol. 16, 2024 .

Conference

10. Z. R. Tapti, M. A. Hasib, A. K. Debnath, and R. A. Emon, "Influence of Elevated Temperatures on the Mechanical Properties of Bagasse Fiber-Reinforced Geopolymer Composites," ***2nd International Conference on Mechanical, Manufacturing and Process Engineering***, 2024 .

9. A. K. Debnath, R. Mustak, M. A. Hasib, and A. Roy, "Enhancing Wood's Mechanical Properties Through Carbon Fiber Reinforcement for Engineering Applications," ***7th International Conference on Mechanical Engineering and Renewable Energy***, 2023 .

8. B. Pal, M. A. Hasib, and A. K. Debnath, "Assessing Heavy Metal Contamination and Public Awareness of Battery Waste Impact in Khulna, Bangladesh," ***7th International Conference on Mechanical Engineering and Renewable Energy***, 2023 .

7. S. Paul, T. I. Palash, A. D. Roy, and A. K. Debnath, "Numerical Analysis of Coronary Stent Alloy Materials During Radial Expansion," ***International Conference on Electrical, Computer and Communication Engineering (ECCE)***, ISBN:979-8-3503-4536-0, IEEE, 2023 , DOI:10.1109/ECCE57851.2023.10101627.

6. R. Ahammad, M. O. Faruk, A. K. Debnath, and M. S. Islam, "Effect of Adhesive Layer Thickness and Adherent Geometry on the Tensile Properties of Adhesively Bonded T-Joint," ***7th International Conference on Engineering Research, Innovation and Education, School of Applied Sciences & Technology***, January, 2023 .

5. R. Ahammad, A. K. Debnath, M. M. Rahman, M. Arifuzzaman, and M. S. Islam, "Mechanical Characterization of Date Palm Rachis Fiber Reinforced Epoxy Composite," ***International Conference on Mechanical, Industrial and Energy Engineering***, 2022 .

4. A. Islam, A. K. Debnath, M. S. Islam, and M. Arifuzzaman*, "Numerical analysis of the rear wing mount of a formula 1 type car for material selection," ***International Conference on Mechanical, Industrial and Energy Engineering 2022***, 22-24 December, 2022 .

3. P. Debnath, A. K. Debnath*, R. Ahammad, M. Arifuzzaman, and M. S. Islam, "Numerical Simulation of Bi-Adhesive Lap Joints," ***International Conference on Mechanical, Industrial and Energy Engineering 2022***, 22-24 December, 2022 .

2. G. Rabbi, M. A. Hasib*, A. K. Debnath, and M. A. Islam, "Fracture Analysis of Adhesively Bonded Joints as a Function of Temperature," ***International Conference on Mechanical, Manufacturing and Process Engineering (ICMMPE â€“ 2022)***, 25-27 June, 2022 .

1. M. N. Jahir, R. Mustak, A. K. Debnath, and P. D. Nath, "ORIENTATION EFFECT OF JUTE-GLASS FIBER REINFORCED COMPOSITE ON MECHANICAL PROPERTIES," ***International Conference on Mechanical Engineering and Renewable Energy 2021 (ICMERE 2021)***, 12-14 December, 2021 .