Department of Materials Science and Engineering
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Pranti Saha
Lecturer
Research Area

Biography

I am a lecturer of Material Science and Engineering (MSE) Department, in Khulna University of Engineering & Technology (KUET), Bangladesh. As a faculty, I am responsible for teaching and mentoring undergraduate students, offering theory and lab courses, as well as providing guidance to their research and thesis initiatives.

My current research interests include -

- **Material simulation and exploration using density functional theory (DFT)**
  - **Electronic, mechanical and Optical properties of inorganic halide perovskites**
  - **Band dispersion and band alignment of 2D heterostructure**
  - **Phonon and thermal properties of quasi-1D materials**
- **Numerical and mathematical modeling of composite-based pressure vessel using finite element simulation (Abaqus)**

Education

- **Education Level: B. Sc.**

  Degree Title: Bachelor of Science in Materials Science and Engineering,
  Khulna University of Engineering & Technology, Khulna, 2017 - 2023.

  CGPA: 3.91 out of 4.00
  Merit Position: 2
  Thesis: Modeling and Stress Analysis of Pressure Vessels Made of Kevlar/Natural Fiber and Hybrid Composites
  Achievement: Dean's list award for excellent academic performance, 2018 - 2023.

- **Education Level: HSC**

  Degree Title: Higher Secondary Certificate (HSC) Exam
  Chuadanga Govt. College, Group: Science, Jashore Board, Bangladesh, 2015 - 2017.

  CGPA: 5.00 out of 5.00
  Achievement: HSC Board Merit Scholarship

- **Education Level: SSC**

  Degree Title: Secondary School Certificate (SSC) Exam
  Chuadanga Govt. Girls' High School, Group: Science, Jashore Board, Bangladesh, 2015.

  CGPA: 5.00 out of 5.00

Service Records

- **Lecturer**
  Department/Section: Dept. of Material Science and Engineering
  Khulna University of Engineering & Technology (KUET) *From 23-03-2023 to 01-01-1970*

Research Interest

Ab initio simulation of inorganic halide perovskite materials

- **Simulation of the structural, mechanical, elastic, electrical and optical properties of new perovskites using the density functional theory.**
- **Extraction of the band properties of perovksites using PBE, PBE+SOC and HSE level of theory.**

Design optimization of multi-layer kevlar composite pressure vessel

- **Developed multi-ply Kevlar reinforced Epoxy pressure vessels analyzed by finite element method (FEM) In Abaqus.**
- **Optimized the pressure vessel design which improved the stress performance while minimizing the number of costly Kevlar fiber layers.**

Finite element modeling of altenative fiber-reinforced composite pressure vessel

- **Developed and simulated composite overwrapped pressure vessel using ABAQUS finite element simulations.**
- **Extracted the burst pressure of pressure vessel made of different combinations of natural and synthetic fibers (Jute, Kevlar, Glass and Aluminum foil).**
- **Jute and Kevlar hybrid pressure vessel is found to have significant strength improvement over pure jute pressure vessel.**

Publication

Books

Journals

1. P. Saha, M. F. Hossain, M. S. Ranaand M. S. Ferdous, "Numerical Modeling of Kevlar/Jute Fiber and Hybrid Composite Pressure Vessels," ***Carbon Trends*** , Elsevier, vol. 13, pp.100304, DOI:https://doi.org/10.1016/j.cartre.2023.100304, 2023 .

Conference

1. P. Saha, M. F. Hossain, M. S. Ranaand a. M. S. Ferdous, "Numerical Analysis and Design Optimization of Kevlar Epoxy Pressure Vessels," ***7th International Conference on Engineering Research, Innovation and Education (ICERIE)***, School of Applied sciences & Technology, SUST, 2023 .