



## Dr. Md. Ashiqur Rahman

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## TEAM MEMBERS

- Dr. Md. Ashiqur Rahman (ASHRAE ID: 8521646)
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- ASHRAE BUET Student Branch

## FUNDING

ASHRAE Grant: \$260

## DURATION

2025-2026

# Design and Development of a Sustainable Spiral Plate Heat Exchanger for Industrial and Educational Applications

Bangladesh University of Engineering and Technology (BUET), Dhaka, Bangladesh

## OUR STORY

This project gave our team the opportunity to translate classroom theory into a practical heat transfer design. During this project, we learned about different kinds of heat exchangers and their applications. Through the design and CFD analysis of a spiral plate heat exchanger, we developed a deeper understanding of how geometry and flow behavior affect thermal performance. Overall, the project helped us build confidence in applying heat transfer concepts to real-world engineering problems.

## OUR PROJECT

We designed a spiral plate heat exchanger for the food and beverage processing industry to cool pasteurized juice from 85 °C to approximately 40–50 °C using river water at 25 °C as the cooling medium. The cooling water exits at around 35 °C, allowing safe disposal back into the river without harming the aquatic ecosystem. The proposed heat exchanger features a compact and easily scalable design, high heat transfer efficiency, energy-saving operation, the ability to handle viscous and fouling fluids, and simple maintenance, inspection, and cleaning.

