SAROJ BASNET

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PROFILE

Mechanical Engineering graduate from IOE, Pulchowk Campus, with research experience in batch distillation and vibration analysis of mechanical systems. Proficient in Python, MATLAB, ANSYS, and SolidWorks, with hands-on fabrication experience. Research interests include computer-aided design and analysis, computational mechanics, numerical modeling, and machine learning.

EDUCATION

Bachelor of Mechanical Engineering

IOE, Pulchowk Campus – Tribhuvan University

May 2021 – April 2025 Pulchowk, Lalitpur

- Relevant coursework: Mechanics of Solids; Strength of Materials; Machine Design & Simulation; Finite Element Method; Numerical Methods; Applied Thermodynamics & Heat Transfer; Fluid Mechanics; Probability & Statistics; Computer Programming; Operation Research.

Higher Secondary Education

Nepal Mega College

2018 – 2020 Babarmahal, Kathmandu

- GPA: 3.65/4.00

PROJECTS

Design, Fabrication and Testing of Batch Distillation Apparatus for Alcohol Micro-Distillery

Bachelor Final Year Project

June 2024 – March 2025 Pulchowk Campus

- A fully functional batch distillation apparatus with reflux and bubble cap trays.
- Improved purity, ethanol concentration, and recovery ratio of the distillate.
- Selected for Pulchowk Innovation Program 2025.
- Patent application filed.

Fabrication of a Plastic Injection Molding Machine

Collaborated with a team of peers

May 2022 – February 2023

- Built a plastic injection molding machine using locally available materials.
- Gained hands-on experience in manufacturing.

AWARDS & HONORS

3rd Rank among 12,000 Students
Secured 3rd position in IOE BE/BArch Entrance Examination 2021.

Winner – Design Hackathon, MechTrix 2025
24-hour 3D design competition project to design a modular, versatile, and cost-effective small-scale agricultural machine for cash crop cultivation in Nepal.

Award-Winning Distillation Project
2nd Runner-up at **Nepal Techno-Fest 2025** and **INNOCHEM'25** programs for designing an innovative batch distillation apparatus.

Best Engineering Award – MechTrix 2023
Built a functional plastic injection molding machine using locally sourced materials.

SKILLS

Engineering Tools: SolidWorks | AutoCAD | ANSYS (Fluent, Mechanical)

Programming & Data Science: Python | Machine Learning | MATLAB | C | Excel Solver

Productivity: Microsoft Word, PowerPoint | LaTeX | Adobe Premiere Pro

Languages: English (Fluent) | Nepali (Native)

EXPERIENCES

Mechanical Engineering Intern

Gorkha Brewery Pvt. Ltd. (Part of Carlsberg Group)

September – October 2024 | Mukundapur, Nawalpur

- Optimized plant layout to improve operational efficiency and workflow.
- Documented mechanical components, machine parts and running hours for maintenance records.

Teaching & Content Creation

November 2022 – August 2025

- Taught Physics entrance preparation classes for +2 students at Nepal Mega College.
- Conducted a workshop on scientific calculator usage for engineering entrance students at Ambition Guru.
- Grew YouTube channel to 10k+ subscribers and 1.5m+ views through educational content creation.

INDEPENDENT RESEARCH AND ONGOING WORK

- **Free Vibration Analysis of a Simplified Compressor Blade Modeled as a Rectangular Plate with NACA 2412 Thickness Distribution**
  Independent Research, 2025. [*GitHub Link*]
  Developed a Python-based semi-analytical model using Reissner–Mindlin plate theory and the Rayleigh–Ritz method, validated with ANSYS (error <3% in first six modes). Currently extending the model to include taper, twist, and rotational effects.
- **Design, Mathematical Modeling, and Experimental Validation of a Batch Distillation Apparatus for Small-scale Alcohol Production.**
  Ongoing work on improving the mathematical model in Python and performing additional experimental trials for validation. Aiming to optimize purity, recovery, and energy efficiency for small-scale distilleries.

REFERENCE

References available upon request.