

# Swaroop Saralkar

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🌐 Swaroop Saralkar

## Professional Experience

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### Siemens Energy Limited

12/2023 – 05/2024 | Vadodara, India

FEA Intern

Project: Modal analysis of 73 blade-rotor system

- Studied turbine blade geometries and their modal and harmonic properties. Visited turbine fabrication and assembly lines and interacted with shop-floor supervisors.
- Performed modal analysis of high pressure stage 73 blade-rotor system with shrouds with ANSYS software. System was solved for 37 harmonic indices with 6 modes each.
- Identified 7 critical frequencies of the system within  $\pm 20\%$  of the operating RPM. Loads on blades at these frequencies were deemed safe within factor of safety.

### Linde Engineering India

06/2023 – 07/2023 | Vadodara, India

Piping Materials Intern

Project: Optimization of bolt load to ensure tight seals in flanges

- Worked on the failure of flanges on bolt loading and determining the maximum possible bolt load for safe and tight flanges.
- Evaluated Class 150 through 1500 rated flanges of multiple materials such as A105, A350 Gr LF2, from NPS 0.5 inches to 24 inches.

## Education

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### NC State University

08/2024 – present | Raleigh, NC

Master of Science, Materials Science & Engineering

### Birla Vishvakarma Mahavidyalaya

09/2020 – 05/2024 | Anand, India

B. Tech in Mechanical Engineering

GPA: 8.05/10

## Coursework

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MSE 500: Modern Concepts of Materials Science | MSE 565: Intro to Nanomaterials |

MSE 791: Quantitative Materials Characterization Techniques

## Projects

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### Effect of Grain Refinement on Magnesium Alloys for Biomedical Applications

05/2023 – 12/2023

- Investigated corrosion resistance of Mg alloy AZ91 by micro-alloying with erbium and carbon inoculation. Corrosion rate decreased by more than 80% for combined Er + C addition.
- Determined that grain refinement has a detrimental effect on the corrosion rate, 66% increase with decreasing grain count.
- Reviewed over 25 research articles on corrosion mechanisms and morphologies of Mg and its alloys. Evaluated biodegradability by immersion testing in Simulated Body Fluid (SBF) & 3.5wt% NaCl. Characterized the alloys by SEM-EDS and XRD analysis along with mechanical testing.

### Design, Analysis & Manufacturing of Electric All Terrain Vehicle

06/2022 – 04/2023

Part of Transmission & Suspension teams.

- Designed EV transmission system for all-terrain performance focused on ease of assembly with 2 battery discharge modes and 2 gear ratios to maximise traction in all conditions.
- Surveyed 5 suspension geometries and built custom geometry for desired vehicle dynamics. Explored pneumatic shocks and their tuning to improve braking performance.
- Finished 9th Overall, 2nd in Traction event, 2nd in Validation Event & 6th in 4hr endurance race in a total of 86 teams participating in SAE e-BAJA.