VASU PATEL

Dayton, OH | vasup126@outlook.com | +1 (765) 771-0543 | LinkedIn | Portfolio

Mechanical Engineer with expertise in product design, 3D modeling, and manufacturing optimization, combining creativity with strong problem-solving skills. Enthusiastic about toys and vehicles, with experience in process improvement, automation, and driving efficiency in fast-paced environments.

EDUCATION

Master of Science in Mechanical Engineering **May 2024**
Purdue University, Indiana GPA – 3.7
Bachelor of Science in Mechanical Engineering **July 2021**
Gujarat Technological University, Gujarat GPA – 9.1

PROFESSIONAL EXPERIENCE

A&B Foundry, Machining & Fabrications, Dayton Ohio – **Manufacturing Engineer December 2024–Present**

- Facilitated cross-functional collaboration between the foundry and machining teams, ensuring 100% compliance with customer quality standards, reducing rework by 95%, saving 20K quarterly.
- Optimized casting processes by refining molding and pouring parameters using Quick-Cast solidification modeling and training floor technicians, resulting in 60% fewer quality issues.
- Managed pilot runs for 50+ new casting products, achieving an 85% first pass yield and ensuring a smooth transition to full-scale production.
- Developed detailed SOPs and work instructions, improving operator consistency and reduced process variability by 10% across multiple products.
- Trained and mentored shop-floor technicians on new processes and tooling, improving operator skill levels and reducing human error-driven defects by 25%.
- Scheduled and tracked multiple high-priority projects using Microsoft Project, improving on-time delivery by 30%, and proactively communicated delays to customers to mitigate impact, align expectations and maintain strong client relationships.
- Implemented scrap reduction initiative by identifying root causes and corrective actions, decreasing material waste by 30% and saving $75K in reworks and customer rejects.
- Designed and produced 5 prototypes using CAD modeling, 3D printing, and extruded aluminum structures, which accelerated product validation & testing, reducing development lead time by 20%.
- Engineered and implemented 5+ custom fixtures for machine tools and grinding stations, this reduced setup time by 40% and improved equipment utilization from 78% to 85%.
- Designed and analyzed casting patterns, selecting optimal pattern material and type to balance customer requirements on end product finish, cost-efficiency, and production lead time.
- Reverse-engineered 8+ legacy components to replicate and modernize products for aerospace applications, replication 99% dimensional and functional accuracy & ensured compliance quality standards.

Tesla GFTX, Austin, Texas – **Manufacturing Engineer** **May 2023 – December 2023**

- Led eight cross-functional manufacturing projects valued at $350K, overseeing the full project lifecycle with detailed planning and scheduling, which drove a 30% increase in process efficiency.
- Prototyped in-house solutions for defective casting parts to reduce waste and energy consumption by 25%.
- Utilized Minitab and Microsoft tools to conduct data visualization and analysis on production information, easing informed manufacturing decisions resulting in 5-6% improvement in production efficiency.
- Designed and fabricated prototype models for casting equipment upgrades applying DFMEA principles, cutting the need for new equipment and saving 100K in new equipment cost.
- Designed and fabricated new furnace doors to integrate degassing equipment, reducing downtime, saving $60K in furnace modifications, and shortening implementation by 2 months while training operators on new processes.
- Conducted dimensional analysis for Cybertruck castings using CMM reports, experimenting with die press parameters (dwell time, temperature, cooling) to reduce variation in critical dimensions, and provided actionable recommendations to process managers and engineering team.

SKILLS

SolidWorks | AutoCAD | Fusion 360 | Rhino 3D | Mechanical/Electrical Design | Mechanism Design | Motor Selection | Finite Element Analysis (FEA) | Acoustic and Vibration Analysis (NVH) | Quick-Cast | Geometric Dimension & Tooling (GD&T) | MATLAB | 6-Sigma | Failure Modes and Effect Analysis (FMEA) | Design of Experiment (DOE) 3D Printing | Creative mind | Adaptable | Critical Thinking | Workflow Optimization | Python | Team Leadership Communication | Problem Solving | Project Management | Detail Oriented | Cross-functional Collaboration

ACADEMIC WORK

Controls Engineering Teaching Assistant – Purdue University

- Mentored 50+ students in a laboratory setting, aiding their understanding of PLC diagnostics, LabVIEW, and MATLAB/SIMULINK for control logic applications.
- Guided student teams in developing a line-follower robot, which secured 5th place in the end-semester controls class competition.

Wind Turbine Analysis on Different Terrains – Purdue University

- Engineered wind turbine blade design using CAD software, which was 3D-printed and subjected to wind tunnel tests across various terrains understanding wake effects and efficiency variance.
- Conducted data acquisition and analysis using MATLAB, applying design of experiment (DOE) and similitude principles to enhance accuracy and reliability of experiment result.

PERSONAL PROJECTS

High-Performance Go-Kart Chassis Design (Feb 2024 – April 2024)

- **Goal:** To create a lightweight, high-performance go-kart chassis that is ideal for racing applications in terms of stability, agility, and structural integrity.
- **Method:** Modeled the chassis in Fusion 360 and performed Finite Element Analysis (FEA) under simulated static, torsional, and dynamic load cases; iteratively refined tube geometry and materials (4130 steel, 6061-T6 aluminum) to reduce mass while maintaining a safety factor of 2.5+.
- **Results:** Achieved a 22% reduction in chassis weight (from 34 kg to 26.5 kg) while maintaining required strength; improved torsional stiffness by 18%, enhancing handling and durability. Strengthened expertise in CAD modeling, structural analysis, and material optimization through iterative design and testing.

3D printed toys and utility items (Mar 2025 – Present)

- **Goal:** The objective was to understand DFM (Design for Manufacturing) for 3D printing, explore market viability on Etsy/Amazon, and practice designing products that address daily-use problems.
- **Method:**
  - **Design & CAD Modeling:** Created prototypes in Fusion 360/SolidWorks ranging from daily-use items (toilet paper roller, vase sump, car seat hooks, charging stands) to toys and models (Lightning McQueen, boats, toy mechanisms).
  - **Market Research:** Analyzed Etsy/Amazon trends to identify profitable 3D printed toys, evaluated copyright vs. Creative Commons designs, and assessed ease of replication vs. originality.
  - **Rapid Prototyping & Material Selection:** Iterated multiple 3D prints to refine tolerances, optimize supports, and reduce failures; selected PLA, PETG, and ABS for strength and durability, applying these choices to complex builds including Lightning McQueen, a motorized boat, and a single-print toy mechanism.
- **Result:** Enhanced surface finish through process optimization (filament size, speed, bed/nozzle temperatures) and post-processing (acetone vapor smoothing, sanding, painting). Reduced average print time by ~1 hour per model via optimized supports and hollow structure redesign. Lowered material consumption by 10% per print while maintaining mechanical strength and functionality. Validated utility prints through user testing and iterative feedback loops, ensuring satisfaction and usability. Conducted market research to strengthen design-for-marketability skills, linking technical design with cost-efficiency and consumer demand.