Alexander Kelly

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EDUCATION

Bachelor of Science in Mechanical Engineering *May 2026*
The University of Texas at Austin, Design & Manufacturing Track, GPA: 3.75/4.00

Relevant Coursework: Robot Mechanism Design, Machine Design, Materials Selection, Mechatronics, Dynamic Systems and Controls, Vibrations, Solids, Heat Transfer, Materials Processing, Fluids

SKILLS

Analysis: GD&T (ASME Y14.5), Tolerance Stacks, FEA, MATLAB, Python, PDM (revision control)
CAD: SolidWorks, Inventor, Siemens Solid Edge, Onshape, Fusion 360
Manufacturing: CNC Mill, Manual Mill/Lathe, Laser Cutting, SLA/FDM 3D Printing, Injection Molding, Soldering
Materials: 6061-T6, 316L, AR500, CFRP (carbon fiber composite), UHMW, HDPE, ABS, PLA, PETG, PMMA
Mechanical Design: Concept Development, Mechanism Layout, Interface Definition, Tolerance-Driven Design, DFM/DFA

PROFESSIONAL EXPERIENCE

Samsung Austin Semiconductor, Austin, Texas *May 2025 - August 2025*
Mechanical Engineer Intern
- Designed a fab-compliant pipe cleaner by deriving torque requirements from drag mechanics, selecting stainless steel to eliminate particle generation, and optimizing for operator portability
- Derived valve operating envelopes using first-principles flow and heat-transfer relationships, validated predictions within 15% of field data, and reduced freeze-failure risk by 20%
- Developed GD&T schemes for rotating assemblies by analyzing H7/g6 bearing fits per ISO 286, calculating runout from tolerance stacks, and defining position tolerances to improve first-pass assembly yield per ASME Y14.5
- Specified an EHS-compliant HV/LV barrier by calculating electrical clearances per NFPA 79, selecting flame-retardant polycarbonate, and defining mounting geometry for serviceability and operator safety

Eco-Sistems Watermakers, Barcelona, Spain *June 2024 - August 2024*
Mechanical Design Engineer Intern
- Redesigned 9 high-pressure membrane housings to address leaking and corrosion by calculating wall thickness from hoop stress, selecting corrosion-resistant materials, and re-architecting sealing geometry
- Designed a modular electrical enclosure by calculating heat dissipation requirements, selecting IP-rated materials for corrosion resistance, and defining ventilation geometry to maintain component temperatures within operating limits
- Standardized 500+ drawings and revision workflows to improve BOM accuracy and configuration control

Texas Inventionworks Makerspace at the University of Texas at Austin *January 2023 – Present*
President • Laser Cutter Team Lead • Electronics Team Lead
- Led operations for 70+ staff across 9 teams by engineering machine utilization, training flow, and safety systems
- Designed modular breadboarding stations by calculating deflection limits for cantilevered shelves, defining datum structures, and tolerance stacks to maintain ±0.5mm alignment across 50+ units
- Engineered access control systems for 40+ machines by defining qualification workflows to credential 4,000+ students

PROJECTS

RC Car Drivetrain *February 2025 - April 2025*
Fabrication and Design Engineer
- Designed a 6.4:1 multi-stage drivetrain by calculating torque from vehicle dynamics, selecting gear ratios for efficiency at target speed, and sizing shafts and bearings using stress and L10 life constraints
- Developed laser-cut chassis and 3D-printed mounts to optimize bearing placement and fastener stacks for stiffness
- Validated drivetrain efficiency within 5% of predictions and iterated motor selection to increase runtime by 40%

Battle Bots IQ SXSW Competition *January 2024 - March 2024*
Hardware Engineer
- Designed structural supports for a 15-lb drum spinner weapon by calculating impact loads from kinetic energy, selecting UHMW and aluminum to balance stiffness and weight, and defining mounting geometry under shock loading
- Developed hex hub retention system to reduce shear stress on weapon fasteners, implemented thrust bearing stacks for axial constraint, and integrated modular interchangeable fork system for opponent-specific wedge configurations