Nicklaus Ferraro

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EDUCATION

Northeastern University, Boston, MA **Expected May 2028**

B.S. Mechanical Engineering | GPA: 3.88 | Dean's List

Relevant Coursework: Statics, Mechanics of Materials, Materials Science, Thermodynamics, Fluid Mechanics, Dynamics

PROFESSIONAL EXPERIENCE

DuPont Water Solutions (MemCor), Marlborough, MA **Jan 2026 – Jun 2026**

Mechanical Engineering Co-op

- Rewrote MemCor's standard MR4 quad-rack drawing set to Revision 1 in Autodesk Inventor after the maintained set had drifted to specify parts the company no longer purchased, and presented the changes to a ten-person engineering department for approval.
- Adapted that baseline into its first custom build: ultrafiltration membrane skids, 23 ft 10 in long at 96 modules per rack, for a water-restoration demonstration facility, released at Revision 0 after redline review.
- Resolved a component clash from client-specified parts in cost order, supporting the part where it sat, then re-routing the pressure transmitter tap from stock nipples and elbows, then adding a frame support that structural analysis confirmed.
- Modeled a custom 316L stainless feed spool and produced its fabrication drawing, calling out welds, pipe schedule, pickling and passivation per ASTM A967, and hydrostatic test with material and test certificates returned.
- Applied separate tolerance schemes for steel fabrication and high-density polyethylene (HDPE) piping when adding hardware to the skid assembly, re-verifying mating-part clearances as layouts changed.
- Released 14 drawing sheets to manufacturing through Autodesk Vault across four packages, owning bills of material (BOMs) of several hundred line items with regional supplier variants and keeping balloon numbers and tags in sync across every sheet.

PROJECTS

SO-101 Teleoperated Robot Arm, 2-Person Team **Sep 2026 – Present**

- Assembled both arms of an open-source SO-101 teleoperated robot as its sole mechanical engineer, and measured the leader trigger's 111° stroke, which drives the gripper 1:1, as the baseline for an ergonomic redesign.
- Traced the stock handle's discomfort to thumb abduction, then designed a tool-free magnetic interface in SolidWorks that makes the leader's handle modular, carrying torque through a drafted square boss, with the first print seating as designed.

Biomimetic Fog Harvesting **Jan 2025 – May 2025**

- Co-designed a passive fog collector modeled on the Namib desert beetle's shell, coating raised bumps with TiO_2 and sealing the valleys to reproduce the wetting contrast that drives droplet nucleation and runoff. Iterated four prototypes in SolidWorks, and the third, a PLA+ funnel form, collected roughly 40% more water than the second.
- Owned the test analysis, processing four 30-minute collection trials (mean 5.5 mL, about 11 mL/hr) and benchmarking output in MATLAB against 11 plant water categories to estimate the design could support 5 of them.

Suez Canal Obstruction Model, 4-Person Team **Sep 2024 – Dec 2024**

- Designed the Arduino control system for a three-stage interactive game on the 2021 Ever Given grounding for middle-school students, a potentiometer driving a servo through a linkage so players rotate the grounded ship proportionally with an RGB indicator keyed to servo position, housed in a laser-cut and 3D-printed model, and ran the project schedule on Gantt charts.

TECHNICAL SKILLS

Software: Autodesk Inventor, AutoCAD, SolidWorks, Autodesk Vault, MATLAB, C++, Arduino, Excel

Design & Documentation: Assemblies, sheet metal modeling, P&ID drafting and composition, piping and spool layout, fabrication detailing, termination point scheduling, BOM management, drawing release and revision control

Standards: PIP drafting standards, ISA instrument tagging, ANSI flange classes and pipe schedules

Materials: 316/316L stainless, HDPE, EPDM, grooved and flanged joints

Prototyping: 3D printing (FDM and SLA), laser cutting, surface coating

INVOLVEMENT & INTERESTS

Organizations & Interests: ASME, Math Club, Pi Kappa Phi Fraternity, Soccer, Backpacking, Golf, Snowboarding, Fishing, Guitar

Leadership: Mentored 100+ students over 3 years through Canterbury School's after-school and summer enrichment programs, and served as both mentor and mentee in the COExist peer mentoring club