

JOHN WHITBREAD

Mechanical Engineering Student | Minor in Nuclear Technology

+1 289-688-8149 • connect@johnwhitbread.com • [linkedin.com/in/john--whitbread](https://www.linkedin.com/in/john--whitbread) • johnwhitbread.com

OBJECTIVE

Mechanical Engineering student minoring in Nuclear Technology, with 20 months of mechanical design internship experience in equipment sizing, P&ID and model verification, and Python automation, seeking co-op roles in nuclear and energy systems.

ENGINEERING EXPERIENCE

VR Mechanical Solutions

May 2024 – Jan 2026

Mechanical Design Engineering Intern

- Audited the Revit plumbing model for a pharmaceutical manufacturing facility across its piping services, P&IDs, and line numbers, using DiRoots SheetLink and Revizto to check model data against the P&IDs and drawings. Flagged incomplete and invalid records, and elements assigned to the wrong P&ID series.
- Compared the manufacturer BOM against the model export, and organized piping and valve tags in Dalux by level and room for field installation verification and walkdowns.
- Helped build coordinated 3D MEP models in Revit, adding material, size, and manufacturer data to model elements.
- Developed the engineering team's standardized Bluebeam Tool Chests (10 tool sets, 157 tools) from team input and industry practice, planned the rollout with the CEO and engineering pursuits manager, and wrote the 6-page user guide.
- Developed SubmitALL, a Python desktop app that assembles shop drawing submittal packages from Word templates, cutting packaging time from 30–60 to 3–8 minutes per package with fewer resubmittals.
- Developed the steam plant schematic for an industrial manufacturing facility by comparing consultant drawings, vendor drawings, and equipment submittals and combining them into a single as-built configuration covering boilers, deaerator, steam distribution, and condensate/feedwater systems.
- Reviewed vendor-selected boilers, pumps, and deaerators against specified equipment for compatibility and equal-or-better specs, and completed lifecycle cost analyses and bid leveling across industrial bids.
- Validated consultant designs on targeted bids through spec review, load calculation validation, and equipment, pipe, and duct sizing checks, and identified RFIs and value engineering options, such as lower-cost material substitutions.
- Completed 100+ pump, pipe, and AHU sizing calculations across 11+ commercial, educational, data center, pharmaceutical, and industrial projects, automating calculations in Python and Excel VBA.
- Helped produce plumbing and mechanical/HVAC drawings for design-assist projects, and contributed to the design of hydronic, sanitary, steam, and process piping systems to ASHRAE, NFPA, and ASME B31.3 requirements.
- Reviewed 50+ shop drawing submittals, tracked Requests for Information (RFIs) in Excel logs, and ran Building Information Modeling (BIM) clash detection in Revit and Navisworks.
- Produced fixture, drain, and trench-drain take-offs (139 fixtures, 191 drains) for a transit maintenance facility budget review, delivered to 7 colleagues.
- Helped a design engineer build AutoCAD MEP pipe fittings, including tees, sanitary tees, elbows, wyes, combination wyes, P-traps, and threaded, welded, flanged, and Victaulic joints.
- Gained hands-on experience using SpoolFab to help produce piping isometrics from model exports.

PROJECTS

Natural-Circulation Loop Model: BWRX-300-Representative SMR

Sept 2026 – Present

Personal Project | Python

- Building a steady-state Python model of natural circulation in a boiling water SMR from public BWRX-300 data.
- Predicting core flow, steam quality, and chimney void fraction across reactor power to characterize loop behavior.
- Applying thermal-hydraulics and two-phase flow principles to represent coolant circulation without pumps.
- Documenting the model as a formal engineering calculation with independent review.

Garmin Connect IQ Widget for Govee Smart Devices

Personal Project, Beta

- Built a Connect IQ Store widget (in beta) that controls Govee smart devices from a Garmin Forerunner 265.

HVAC Duct Sizing Calculator

Personal Project, 2025

- Built a Python calculator for sizing HVAC ductwork.

Lunch & Learn: Hydraulic Loops, Accessories & Pumping Arrangements

Feb 2025 – Mar 2025

VR Mechanical Solutions | Co-presenter with a P.Eng. mechanical design engineer

- Co-developed a hybrid session for 30 engineering and construction staff on hydronic fundamentals, reverse return, hydraulic separation and buffer tanks, variable vs. constant flow, and primary/secondary/tertiary circuits.

STUDENT TEAMS & EXTRA-CURRICULAR ACTIVITIES

Ontario Tech Nuclear Engineering Team (OTNET)

2026 – Present

Member, Fuel Handling Team

- Developing a scaled-down CANDU Fuel Handling Machine that will remotely load new fuel bundles and remove used bundles from fuel channels, demonstrating the key mechanical and control principles of the real machine.
- Currently in the strategy phase, defining the machine's scope, requirements, and design approach before CAD design.
- Reviewing applicable codes and standards to keep the scale model as true as possible to the real CANDU machine.
- Will build and integrate motion, gripping, and positioning mechanisms, structure, motors, actuators, and controls.
- Will test alignment, movement, and fuel-transfer functions and refine the prototype for safety, accuracy, and reliability.

Ontario Tech Student Clubs – General Member

Current

- North American Young Generation in Nuclear (NAYGN) Ontario Tech Chapter • Canadian Nuclear Society (CNS) Ontario Tech Branch • ASME Ontario Tech • Engineers Without Borders • Sustainable Energy Association

ADDITIONAL EXPERIENCE

Brinkman

May 2026 – Jul 2026

Reforestation Planter – Hearst, Ontario

Town of Whitby

May 2023 – Sept 2023

Crew Leader, Summer Student – Parks Maintenance (Parks Division, Operations Department)

- Led a crew of 7 summer students maintaining about 840 acres of parkland across 125 parks and 75+ km of trails.
- Directed inspections, repairs, and upgrades to park amenities, working with residents to prioritize crew resources.

WindReach Farms

2021 – 2022

Assistant Groundskeeper and Head Weekend Maintainer

- Led mechanical and building maintenance across 105 acres of farm grounds, gardens, paths, and structures.
- Completed repairs using sandblasting, MIG welding, sheet metal, woodwork, and automotive tools, and operated tractors, gators, and trucks.

EDUCATION

Ontario Tech University

Oshawa, Ontario

Bachelor of Mechanical Engineering, Minor in Nuclear Technology

Anticipated 2028

- **Coursework:** Nuclear Plant Operation (NUCL 4640U, in progress), Nuclear Engineering Fundamentals (NUCL 2240U)

Massachusetts Institute of Technology

Remote Learning, Aug 2024

- MIT 22.02 Introduction to Applied Nuclear Physics; MIT 22.05 Neutron Science and Reactor Physics

CanTeach (Canadian Teaching Materials for Nuclear Technology)

Self-Directed, Ongoing

- CANDU Fuel Management Course – Ben Rouben; Design of CANDU Reactors, Session 5: Design of Fuel Channels
- The Essential CANDU – Wm. J. Garland: Ch. 6 Thermal-Hydraulic Design, Ch. 8 Nuclear Plant Systems, Ch. 10 Instrumentation and Control, Ch. 20 Fuel Handling and Storage

EOP – Electrical Engineering Portal

Remote Learning, Sept 2024 – Ongoing

- Ultimate Electric Circuits Course for Electrical Engineers; PLC Ladder Programming Using LogixPro Simulator; Power Engineering: Generators, Transformers, and Transmission Lines

CERTIFICATIONS & TECHNICAL SKILLS

- Procore Certified: BIM Manager, Engineer, and Project Manager (2024) • AutoPIPE Stress Analysis (Udemy, 2024)
- Nuclear Facility Design Consideration, NUC-115 (Engineering PDH, 2024)
- Worker Health and Safety Awareness (Government of Ontario, 2024) • First Aid and CPR (Red Cross, Current)

Nuclear: Reactor Physics • OpenMC Monte Carlo Code • Nuclear Power Plant Operation & Nuclear Safety

Piping & Codes: ASME B31.1 / B31.3 • ASME Section III • API 570 • NFPA • P&ID Review • ANSI/ISA 5.1

HVAC & Thermal: Pump, Pipe & AHU Sizing • Hot/Chilled Water & Glycol • ASHRAE 90.1 / TC 9.9 • Trane TRACE

Design & BIM Software: SolidWorks • AutoCAD • AutoCAD MEP • Revit • Navisworks • Revizto • SpoolFab • SketchUp

Model Data Review: DiRoots SheetLink • Dalux • Revit Model Data Auditing • BOM Comparison

Programming & Controls: Python • C++ • Fortran • Excel VBA • PLC (Ladder Logic) • Pressure / Level Measurement

Project Tools & Methods: Bluebeam • Procore • DesignBuilder • Word • Excel • Lifecycle Cost Analysis • Bid Leveling

Hands-On & Languages: MIG Welding • Sheet Metal • Machining • Heavy Equipment • English • French (DELF B1)