Nassar Shakir

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Education

University of Ottawa — Ottawa, ON
Bachelor of Applied Science in Chemical Engineering — *Sept. 2021 – May 2026*

University of Ottawa — Ottawa, ON
Bachelor of Science in Computing Technology — *Sept. 2021 – May 2026*

Engineering Projects

Vinyl Acetate Monomer Plant Design — Jan. 2026 – Present
University of Ottawa — *Ottawa, ON*

- Designed and simulated an industrial-scale vinyl acetate monomer production facility.
- Conducted literature review and market analysis.
- Developed full Aspen HYSYS process flowsheet for reactor, heat integration, separation, and recycle streams.
- Sized and optimized plug flow reactor (PFR), heat exchanger, and distillation column.
- Performed economic feasibility studies and HAZOP safety analysis.

Process Control: Controller Design — Sept. 2025 – Dec. 2025
University of Ottawa — *Ottawa, ON*

- Used Altair Embed to simulate controllers for a distillation column.
- Tuned controller parameters using Direct Synthesis method.

Reactor Design Project — Sept. 2025 – Dec. 2025
University of Ottawa — *Ottawa, ON*

- Implemented adaptive Runge–Kutta–Fehlberg (RKF45) numerical method in VBA to simulate packed bed reactor (PBR) behavior.
- Optimized reactor performance using Excel-based simulations.

Renewable Methanol Production from CO_2 and Green Hydrogen — May 2025 – Aug. 2025
University of Ottawa — *Ottawa, ON*

- Designed 40,000 tonne/year methanol plant (99.5% purity) using Aspen Plus.
- Developed full process flowsheet including reactor, separation units, and recycle streams.
- Performed mass and energy balances and preliminary equipment sizing.

Packed Absorption Tower Design and Optimization — Jan. 2025 – April. 2025
University of Ottawa — *Ottawa, ON*

- Designed and optimized a packed absorption column for 99% ethanol recovery using HTU/NTU correlations.
- Selected packing type/size; determined column diameter and height.
- Evaluated pressure drop, cost, and operating conditions via Excel-based simulator.

Computer Science Projects

Stable Marriage Resident Matching Service — Jan. 2026 – Present
Java, Golang, Scheme, Prolog — *Ottawa, ON*

- Implemented Gale–Shapley stable matching algorithm for medical resident allocation.
- Validated correctness through edge-case and stress testing.

LocalLoop – Community Events Android Application — May 2025 – Aug. 2025
Android Studio, Java, Firebase, GitHub — *Ottawa, ON*

- Designed and developed Android application for managing and discovering community events.
- Implemented role-based access control (Admin, Organizer, Participant).
- Enabled event creation, editing, deletion with categories, dates, and fees.

Technical Skills

Simulation Software: Aspen HYSYS, Altair Embed, Aspen Plus
Languages: Java, Python, Golang, Scheme, Prolog, Firebase
Developer Tools: Git, VS Code, Android Studio, IntelliJ