Curriculum
Master of Science (M.S.) Chemical Engineering

1 Year Online, 9 courses, 36 Credits, Standard for U.S. Masters Degree

Process Design and Simulation: Covers process flow diagrams (PFDs), piping and instrumentation diagrams (P&IDs), process simulation software (e.g., Aspen Plus, ChemCAD), and case studies. 4 Credits.

Unit Operations in Chemical Engineering: Emphasis on separation processes (distillation, filtration, extraction), heat exchangers, and fluid flow in a plant context. 4 Credits

Chemical Plant Operations and Safety: Explores practical aspects of plant operations, safety regulations (e.g., OSHA, HAZOP), alarms, interlocks, and emergency response systems. 4 Credits.

Process Control and Instrumentation: Basic concepts of control loops, sensors, control valves, PLC/SCADA systems. Focus on industrial practice over theoretical control math. 4 Credits.

Materials and Corrosion in Process Industries:Applied understanding of metals, polymers, and composites used in chemical plants, with a focus on corrosion prevention and material compatibility. 4 Credits.

Chemical Engineering Thermodynamics (Simplified): Conceptual thermodynamics for real-world applications (e.g., phase equilibria, energy balances) without rigorous calculus or derivation-heavy material. 4 Credits.

Bioprocess Engineering for Chemical Engineers. A light-math introduction to fermentation, bioreactors, and downstream processing relevant to the pharmaceutical and biotech sectors. 4 Credits.

Energy Systems and Heat Integration. Covers pinch analysis, steam systems, and energy optimization in chemical plants, focusing on conceptual understanding over numerical modeling. 4 Credits.

Water and Wastewater Treatment for Industry: Practical techniques for effluent treatment, sludge management, and water reuse relevant to chemical process industries. 4 Credits.

Courses may be substituted or changed at any time,
as curriculums undergo continued revision and updating.