

STRUCTURE

Chemical Engineering faculty will provide day-to-day guidance of the developments in the lab. A technician will report to the Chair or a designated faculty. An Advisory Committee will be chosen from local or national/international industry and from nationally ranked Chemical Engineering departments. This committee will meet annually to give longer-term guidance to the lab development. Meetings could be in Chattanooga or during the Annual AIChE meeting.

FUNDING

To fund a program of this magnitude, a \$3 Million endowment would ensure its sustainability.

Funds will be held by the UC Foundation and will be managed according to the Foundation's investment policies that ensure stability. Monies identified for this fund will only be used for the Chemical Engineering Lab. State funding for UTC is totally separate from the UC Foundation.

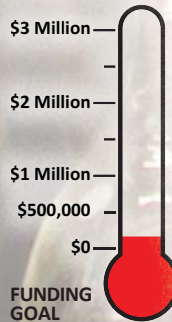


We Need You

Please consider giving at your most generous level to make the Chemical Engineering Lab possible. Our goal is to raise \$3 million in order to assure a comprehensive and modern lab.

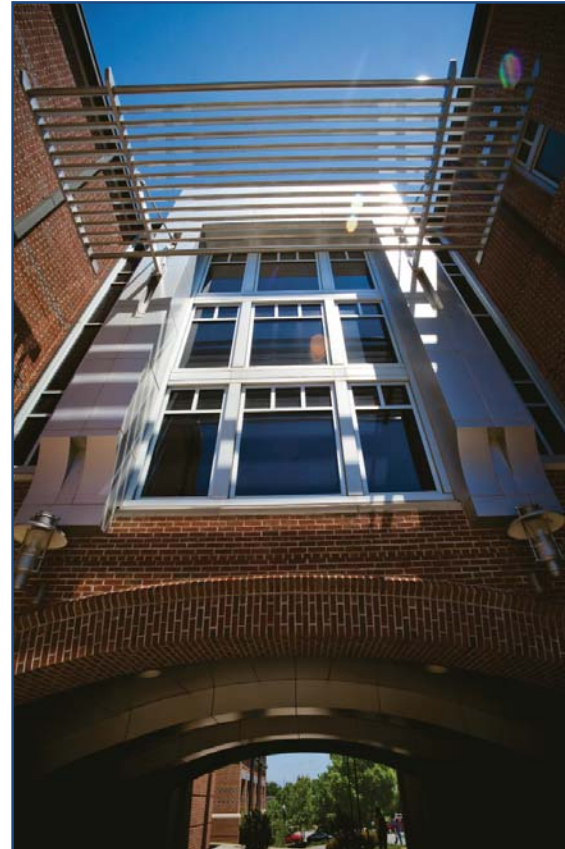
We are also looking for a few volunteers to help us develop, build, and maintain an annual giving program that will be necessary to achieve the fund's goals. Please let us know if you are interested and could spare some time to stay connected with alumni from your class era and assist with reaching out to Industry and potential future classes of students.

For more information on the Chemical Engineering Lab project, please contact Christa Mannarino, fund-raising officer for Chemical Engineering at 423- 425-4728 or via e-mail at Christa-Mannarino@utc.edu



THE UNIVERSITY of TENNESSEE at CHATTANOOGA COLLEGE of ENGINEERING & COMPUTER SCIENCE

THE CHEMICAL ENGINEERING LAB FUND



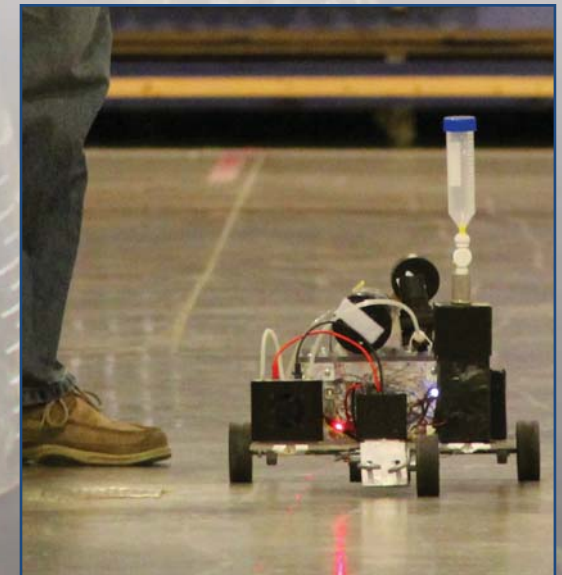
*A Vision for the Future
Chemical Engineering at UTC*

VISION

Already recognized as one of the leading labs in the world for remote experimentation, the ChemE Lab will exist to ensure a stellar laboratory education for Chemical Engineering students that is transferrable and scalable for other universities statewide, nationwide and worldwide.

STRATEGIES

1. Develop and expand the existing chemical engineering lab at UTC into a world class Chemical Engineering Lab that would be utilized by students, faculty and industry unhampered by geographic location.
2. Provide under-equipped universities with high quality learning opportunities for their students via the web using state-of-the-art camera and video technologies.
3. Deliver dynamic laboratory instruction by internationally respected faculty and subject matter experts.
4. Add new equipment each year to provide the capability for remote operation, remote collaboration and remote viewing.



Building the ChemE Lab Fund

Potential Laboratory Systems

Equilibrium Stages

Distillation, Batch, Continuous, Reactive, Cryogenic
Liquid-Liquid Extraction
Supercritical Extraction
Adsorption – Pressure Swing Adsorption
Reverse Osmosis
Ion Exchange
Ultrafiltration

Heat Transfer

$Q=UADT, k, h, Nu$
Steady-state and transient heat conduction
and natural and forced convection
Shell & Tube Heat Exchanger system
Instrumented refrigeration system

Reactors -- Liquid

- Batch
- Polymerization
- PFR
- Series
- Multi-CSTR liquid phase reaction system

Reactors -- Catalytic

Fermentation

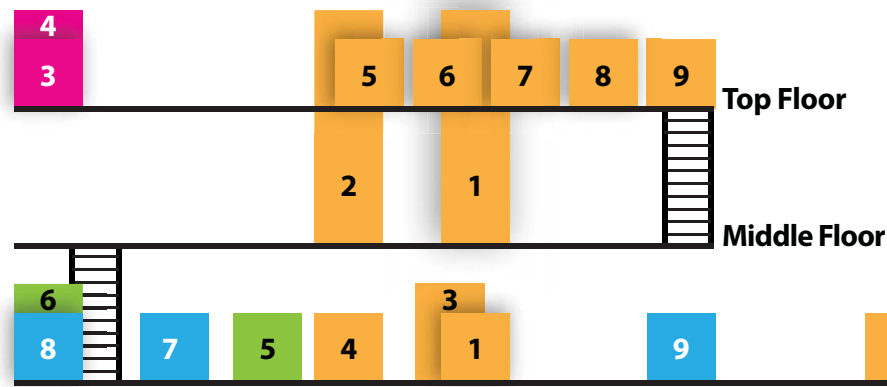
Other, miscellaneous

Batch Drying system
Multiphase Flow
Centrifugal pumps
Other Pumps
Packed Beds
Fluidization
Mixing
Diffusion
Membrane Gas Permeation
Vacuum Drying
Climbing Film Evaporator
Pervaporation Membrane System
Supercritical Fluids
Plate and Frame Filtration
Cooling Tower

Analytical Equipment

- HPLC
- Gas Chromatographs - FID, TCD
- Mass Spectrometer
- FTIR
- Atomic Absorption
- NDIR Analyzers
- Refractometer

ChemE Lab



Top Floor

- 1 Distillation Column
- 2 Gas Absorber
- 3 Pressure Swing Adsorption
- 4 PEM Fuel Cell
- 5 Speed Recording Controller
- 6 Current Recording Controller
- 7 Voltabe Recording Controller
- 8 Temperature Recording Controller
- 9 Pressure Recording Controller

Middle Floor

- 1 Distillation Column
- 2 Gas Absorber

Bottom Floor

- 1 Batch Drying System
- 2 Vapor Compression-Refrigeration
- 3 Parr Bomb Calorimeter
- 4 UV-Vis Spectrophotometer
- 5 Multi-Tank Reaction System

- 6 Shell and Tube Heat Exchanger System
- 7 Gas Fueled Combustion
- 8 Heat Transfer-Conduction, Convection, SS, and Transient
- 9 4-Input, 4-Output Control

Building the ChemE Lab

Support for Success – A Five-Year Plan

Year 1 – 2013-14

- Hire full-time Lab Director
- Extend collaboration invitation to universities and industry partners
- Install Packed Column Absorber system
- Install Batch Drying system
- Install Instrumented Refrigeration system
- Install Steady-state and transient heat conduction and natural and forced convection system

Year 2 – 2014-15

- Establishment of Chem E Lab Advisory Committee
- Install Multi-CSTR liquid phase reaction system

- Establishment of Graduate Research Fellows (GRFs) including a program to recruit the top students to come to UTC
- Identify loaned instructors and visiting executives from industry partners

Year 3 – 2015-16

- Liquid-Liquid Extraction
- Supercritical Extraction
- Reverse Osmosis
- Ion Exchange
- Ultrafiltration
- Review and assess

Year 4 – 2016-17

- Polymerization
- Fluidization
- Mixing

- Diffusion
- Membrane Gas Permeation
- Roll out of certification offerings to companies
- Initiate outreach to K-12 and STEM partners
- First round of undergraduates graduate

Year 5 – 2017-18

- Multiphase Flow
- Centrifugal pumps & compressors
- Packed Beds
- Vacuum Drying
- Climbing Film Evaporator
- Pervaporation Membrane System
- Supercritical Fluids
- Plate and Frame Filtration

