CHEMICAL ENGINEERING 140
COURSE SUMMARY

"The design and analysis of system governed by physical and chemical rates"

analysis:
model building, conservation of mass, and hydraulic residence times

design:
steady-state hydraulic systems, conservation of mass in steady state systems; desalination, process flow-sheeting and problem definition, recycle

analysis:
modeling chemically reacting systems, r and k

design:
complex kinetics, batch reactors; CSTR economics, multiple steady states,

analysis:
conservation of assets

design:
process economics

analysis:
multiphase mass transfer, mass transfer rates, timescales

design: equilibrium stages; multiphase unit operations, counter current design, McCabe-Thiele analysis

analysis:
dimensional analysis and Buckingham Pi Theorem

design:
biomechanics, fluid mechanics, orifice design, tray hydraulics

analysis:
conservation of energy (1st Law for Open Systems), conservation of assets

design:
mixing, phenomenological heat transfer (Newton's Law of Cooling), heat exchangers

analysis:
thermochemistry, heats of reaction, energy conservation in non-isothermal reactors, T-t profiles

design: deconstructing chemical accidents, runaway reactors, adiabatic flames