CHEE 204 Chemical Engineering Principles 2

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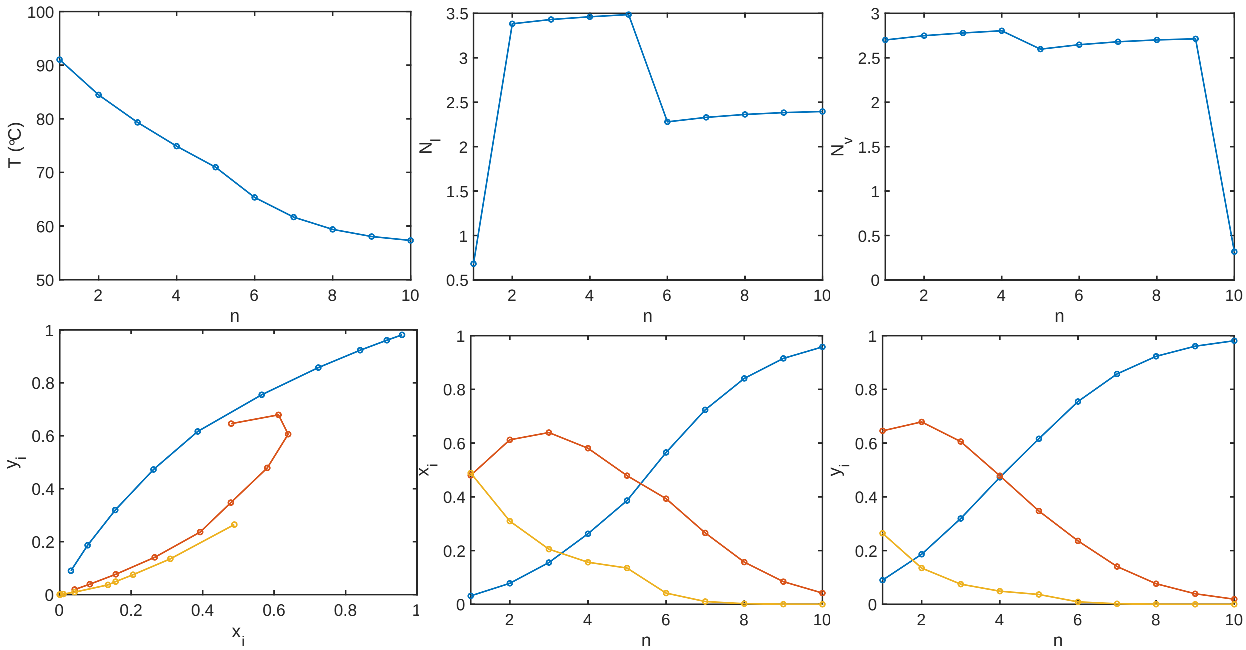
CHEE 204 course-evaluation metrics (2021)

- Q1. Overall, this is an excellent course. Hill 4.2 (DCM 3.6)
- Q2. Overall, I learned a great deal from this course. Hill 4.2 (DCM 3.8)
- Q3. Overall, this instructor is an excellent teacher. Hill 4.5 (DCM 4.1)
- Q4. Overall, I learned a great deal from this instructor. Hill 4.5 (DCM 4.1)

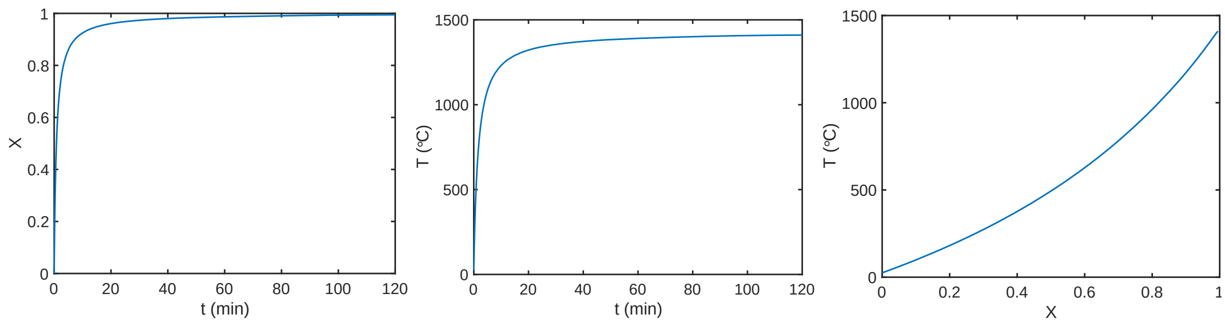
DCM = department course mean.

- PART I (material balances and DOF)
  Lecture 1: Steady state material balance on a single unit, without reactions
  Lecture 2: Mass and mole fractions as independent stream variables, DOF analysis
  Lecture 3: Manual and computer solution strategies, basis
  Lecture 4: Subsidiary relationships for mechanical separations
  Lecture 5: Subsidiary relationships for splitters
  Lecture 6: Multi-unit processes, solution strategy
  Lecture 7: Material balances with chemical reactions
  Lecture 8: Single reactor, total mole conservation
  Lecture 9: Reaction jargon
  Lecture 10: Multi-unit process with reactions
  Lecture 11: Element balances
  Lecture 12: Relationship between element and species balances
  Lecture 13: Theoretical and actual combustion of fuels

- PART II (energy balances)
  Lecture 14: Steady state energy balance on a single unit
  Lecture 15: Calculating relative enthalpies I
  Lecture 16: Calculating relative enthalpies II
  Lecture 17: Vapor-liquid equilibrium flash calculations
  Lecture 18: Dew and bubble point calculations
  Lecture 19: Calculating relative enthalpies III
  Lecture 20: Direct experimental determination of heats of reaction
  Lecture 21: Heats of reaction from heats of formation
  Lecture 22: High-temperature combustion reactions
  Lecture 23: Combustion of fossil fuels
  Lecture 24: Humidification operations
  JANAF tables
  Lecture 25: Wet-bulb temperature
  Lecture 26: Psychrometric chart
  Lecture 27: Combined material and energy balances: DOF and strategy
  Lecture 28: Multi-unit DOF with energy balances I
  Lecture 29: Building a distillation column model
  Lecture 30: Multi-unit DOF with energy balances II
  Lecture 31, 32: Multi-unit DOF with energy balances III
- PART III (dynamic balances)
  Lecture 33: Unsteady material balances (w/o reactions)
  Lecture 34: Unsteady energy balances I (w/o reactions)
  Lecture 35: Unsteady balances II (reacting systems)



Steady coupled material and energy balances, with thermodynamic subsidiary relationships. Optimized separation of acetone from a multi-component feed, 10 stage distillation (basis 1 mol): $\dot{Q}_c = -69.98$ kJ/mol, $\dot{Q}_r = 87.48$ kJ/mol, $N_f = 1$ mol (basis), $T_f = 25°$C, $X_f = 0$, $p = 101.3$ kPa.



Dynamic coupled material and energy balances with ideal equation of state as subsidiary relationships. Adiabatic batch reactor: $A + B \to C$, exothermic, assuming an ideal gas with constant (temperature-independent) reaction rate constant.