

## CHEMICAL ENGINEERING 4903-1

### Fall Semester 2009

Short Assignment –Mapping (Due by 5 PM, September 2, 2009)

Submit your work to Chemical Engineering Office, 3290 MEB

Draw a floor plan of the Chemical Engineering Laboratory (3520 MEB). Include principal pieces of process equipment, analytical equipment, and the location of all safety equipment. Confine your plans (sketches) to areas used in the senior project laboratory course; do not consider graduate research offices or research laboratories.

Additional Notes:

- (1) Your sketches should be included in your laboratory notebook as well as submitted to us.
- (2) Though not necessarily made to scale, your sketches and captions should be prepared with care and neatness.
- (3) As with conventional plans and maps, north should be labeled at the top of each sheet.
- (4) Safety equipment which must be identified includes:
  - a. Fire extinguishers
  - b. Fire alarms
  - c. Fire blankets
  - d. Safety showers\*
  - e. Eye wash fountains
  - f. First-Aid kits

**\*Do not test-pull a safety shower chain;** the safety showers will not shut off until an embarrassing amount of water has been discharged. Operate the safety showers only in the case of a real emergency.

- (5) The principal pieces of laboratory equipment include the following:
  - a. Distillation column
  - b. Batch distillation column
  - c. Extruder
  - d. Gas absorber columns
  - e. High pressure glass lined reactor
  - f. Vacuum drying oven
  - g. Spray drier
  - h. Fluidized bed apparatus
  - i. Double-pipe heat exchanger
  - j. Shell-and-tube heat exchanger
  - k. Gas flow circuit
  - l. Liquid flow circuit
  - m. CSTR/Tubular reactor
  - n. pH Control System
  - o. Liquid level control system
  - p. Multivariable control system
  - q. Catalytic reactor
  - r. Fermentor/Bioreactor
  - s. Heat control experiment
  - t. Liquid level flow control
  - u. Spray dryer
  - v. Heat conduction system
  - w. Fuel cell system
  - x. Matlab level control system
  - y. Matlab crane control system
  - z. Dialysis apparatus
  - aa. Ultrafiltration apparatus
  - bb. DI H<sub>2</sub>O Source
  - cc. Any other major equipment

- (6) The principal pieces of analytical equipment include the following:
  - a. HPLC
  - b. Densitometer
  - c. Refractometer
  - d. Viscometers
  - e. Flame AA
  - f. UV/VIS
  - g. FTIR
  - h. GC
  - i. Laboratory barometer
  - j. Any other major equipment

Submit your assignment in the form of a memorandum. Your written response to this assignment will be graded, and will be worth 20 points (≈5%) in your overall class grade.