

# CHE 494/594 Oil and Gas Engineering

1. Petroleum reservoir engineering
  - a. Origin and composition of petroleum
  - b. Petroleum geology
  - c. Reservoir rock and fluid properties
  - d. Flow of oil and gas in reservoirs
  - e. Oil well drilling methods
  - f. Predicting reservoir performance
  - g. Enhanced Oil recovery
  
2. Petroleum Refinery Engineering
  - a. Characterization of crude oil and refinery products
  - b. Crude distillation process (atmospheric and vacuum distillation units)
  - c. Thermal and catalytic cracking
  - d. Catalytic reforming
  - e. Hydro cracking
  - f. Hydro desulfurization
  - g. Light end processes: alkylation, isomerization and polymerization
  - h. Heavy end processes: coking, visbreaking, deasphalting and dewaxing
  - i. Lube oil base stock production
  
3. Natural Gas Engineering
  - a. Determination of natural gas properties (specific gravity, pseudo critical properties viscosity, compressibility factor etc.)
  - b. Gas reservoir deliverability (IPR curve)
  - c. Well bore and wellhead choke performance
  - d. Processing: dehydration, gas-treating
  - e. Transportation, measurement and pipeline cleaning
  - f. Gas to liquids