

# ChE/AAS 277 Energy Resources and Utilization

**Instructor: Ben W. Ebenhack**

**Grading: 50% on research paper (due at semester's end), 40% quizzes, 10% mid-term draft of paper**

## Course Outline

- I. Overview of energy resources
  - A. Types of energy
    - 1. Fossil fuels: coal, oil, gas, and 'oil shale'
    - 2. Geothermal
    - 3. Nuclear
    - 4. 'Renewable': solar, wind, hydro-electric
    - 5. Biomass
  - B. Present availability and potential
- II. Coal
  - A. Geology and origin
  - B. Mining
  - C. Hazards
  - D. Transportation and consumption
- III. Oil and gas
  - A. Geology and origin
  - B. Exploration technologies
  - C. Drilling
  - D. Production
  - E. Enhanced recovery
- IV. biomass
  - A. Dependence of LICs
  - B. Questions of renewability
  - C. Environmental impact
  - D. Potential
- V. Hydro-electric
  - A. Large-scale dams
  - B. Micro-hydro
- VI. Solar and Wind
  - A. Potential
  - B. Techniques for acquisition
  - C. Limitations
- VII. Geothermal
  - A. Occurrence
  - B. Acquisition
  - C. Limitations and potential

- VIII. Nuclear Power
  - A. Fission and fusion
  - B. Perceptions
  - C. Limitations
- IX. Issues of context
  - A. Level of need
  - B. Scale
  - C. Infrastructure
  - D. Ability to pay
  - E. Resource availability
- X. Environmental impacts
  - A. Surface impacts: strip mines, forest loss, oil spills.
  - B. Pollution
  - C. Global climate change
- XI. The future
  - A. Oil depletion
  - B. Conservation
  - C. Viable alternatives
  - D. Requirements