ME 43000
POWER ENGINEERING

Course Outcomes [Related ME Program Outcomes in brackets]

1. Provide a basic understanding of the operation, construction and performance of fossil fuel power plant equipment. [A2, A3]
2. Provide a basic knowledge of the generation and distribution of electric power. [A2, A3]

1. Fuels
2. Combustion
3. Energy balances
4. Steam generator designs

Steam Generation (3 wks)

1. First Law analysis
2. Second Law analysis
3. Regeneration
4. Reheat
5. Heater designs
6. Condenser designs

Rankine Cycle Analysis (3 wks)

1. Steam turbines
2. Draft
3. Fans
4. Pumps
5. Cooling towers

Power Plant Auxiliaries (4 wks)

1. North Power Plant
2. South Power Plant
3. Utility Tunnels

Energy Management (3 wks)

Field Trips (2 wks)
1. COURSE NUMBER AND NAME: ME 43000 Power Engineering

2. CREDITS AND CONTACT HOURS: 3 credits
   a. Lecture – 3 days per week at 50 minutes for 16 weeks

3. COURSE COORDINATOR OR INSTRUCTOR:
   Heather L. Cooper, MET Department

4. TEXTBOOK:
   *Powerplant Technology*, M. M. El-Wakil, McGraw-Hill, 2002,
   ISBN 9780072871029

5. SPECIFIC COURSE INFORMATION:
   a. Course Description: Rankine cycle analysis, fossil-fuel steam
      generators, energy balances, fans, pumps, cooling towers, steam
      turbines, availability (second law) analysis of power systems, energy
      management systems, and rate analysis. Typically offered in the fall.
   b. Prerequisites:
      ME 20000 – Thermodynamics I
   c. Status: Elective

6. SPECIFIC GOALS FOR THE COURSE
   a. Course Outcomes:
      [Related ME Program Outcomes in Brackets]
      1. Integration of *fundamentals* (thermodynamics, heat transfer,
         fluid mechanics, numerical methods) to solve practical
         problems. [A2, A3, A5, A7]
      2. Provide fundamental understanding necessary to design and
         analyze systems and equipment used in conditioning buildings.
         [A2, A3, A5, A7]

   b. Related ME Program Outcomes:
      [Related ABET Outcomes Listed in Brackets]
      A1. Engineering Fundamentals; B3. Prof/Ethical Responsibility;
      A3. Experimental Skills; B5. Life-Long Learning;
      A4. Modern Engr Tools; C1. Leadership,
      A5. Design Skills; C2. Global Engineering Skills;
      A6. Impact of Engr Solns; C3. Innovation;
      B1. Communication Skills; C4. Entrepreneurship
      B2. Teamwork Skills

7. LIST OF TOPICS: See following page

PREPARED BY: Heather Cooper, MET

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