ME 43800  
GAS TURBINE ENGINES

**Course Outcomes** [Related ME Program Outcomes in brackets]

1. Basic performance characteristics of *shaft power gas turbine engines*. [A2, A3]
2. Basic performance characteristics of *gas turbines for aircraft propulsion*. [A2, A3]
5. *Design and off-design operation*. [A2, A3]

**Fundamental Concepts** (3 wks)

1. Basic Equations
2. Stagnation Properties
3. Continuity relationships
4. Compressible flow

**Shaft Power Cycles** (5 wks)

1. Simple Cycle
2. Cycle Variations
3. Cycle Definition and Analysis
4. Component Performance
5. Power Balance
6. Design Point Performance

**Aircraft Propulsion Cycles** (4 wks)

1. Turbojet Cycle
2. Thrust
3. Engine Performance Parameters
4. Turbojet Performance
5. Turbofan Cycle and Performance
6. Design and Off-Design Performance

**Aerodynamics of Compressors and Turbines** (3 wks)

1. Energy Transfer
2. Velocity Diagrams
3. Radial equilibrium
4. Degree of Reaction
5. Axial and Radial Compressors
6. Axial Turbines
7. Wind Turbines
1. **COURSE NUMBER AND NAME:** ME 43800 Gas Turbine Engines

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

3. **COURSE COORDINATOR OR INSTRUCTOR:**  
   S. Fleeter

4. **TEXTBOOK:**  

5. **SPECIFIC COURSE INFORMATION:**  
   a. **Catalog Description:** Basic operating principles and analysis of performance characteristics of gas turbine engines for aircraft and vehicular propulsion and stationary power. Turbojet, turbofan, turboshaft cycle analysis. Analysis of flow through compressors, turbines, combustors, inlets, nozzles, and regenerators. Component machine and off-design performance. Inspection trip to industrial plan required. Typically offered in spring.  
   b. **Prerequisites:**  
      ME 30000 – Thermodynamics  
      ME 30900 – Fluid Mechanics  
   c. **Status:** Elective

6. **SPECIFIC GOALS FOR THE COURSE**  
   a. **Course Outcomes:**  
      [Related ME Program Outcomes in Brackets]  
      1. Basic performance characteristics of *shaft power gas turbine engines*. [A2, A3]  
      2. Basic performance characteristics of *gas turbines for aircraft propulsion*. [A2, A3]  
      3. Cycle analysis. [A2, A3]  
      5. Design and off-design operation. [A2, A3]  
   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:** S. Fleeter  
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