ME 56000
KINEMATICS

Course Outcomes

1. Study design of planar mechanisms.
2. Graphical techniques to kinematic synthesis.
3. Study finite and infinitesimal rigid body motion.
4. Use curvature theory in the synthesis of planar mechanisms.

Infinitesimal Motion (4 weeks)
1. Point Path
2. Geometry
3. Instant Centers
4. Velocity Analysis
5. Acceleration Analysis
6. Jerk Analysis

Curvature Theory (4 weeks)
1. Radius of Curvature
2. Center of Curvature
3. Inflection Circle
4. Bresse Circle
5. Stationary Curvature

Mechanism Design (2 weeks)
1. Planar Type Synthesis
2. Linkages
3. Cam-Follower System

Finite Motion (3 weeks)
1. Synthesis
2. Two Positions
3. Three Positions
4. Four Positions

Mechanism Design (2 weeks)
1. Continuous Motion
2. Assembly Configurations

Revision Date: 7/02/12
**COURSE NUMBER AND NAME:** ME 56000 Kinematics

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

**3. COURSE COORDINATOR OR INSTRUCTOR:**
   G.R. Pennock

**4. TEXTBOOK:**

**5. SPECIFIC COURSE INFORMATION**
   a. **Catalog Description:** Geometry of constrained plane motion with applications to linkage design. Type and number synthesis, size synthesis. Path curvature, inflection circle, cubic of stationary curvature. Finite displacements, three and four separated positions. Graphical, analytical, and computer techniques. Typically offered in the fall.
   b. **Prerequisites:**
      ME 35200 – Machine Design I
   c. **Status:** Elective

**6. SPECIFIC GOALS FOR THE COURSE**
   a. **Course Outcomes:**
      1. Study design of planar mechanisms.
      2. Study finite and infinitesimal rigid body motion.
      3. *Graphical techniques* to kinematic synthesis.
      4. Use *curvature theory* in the synthesis of mechanisms.

   b. **Related ME Program Outcomes:**
      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:** G.R. Pennock

**REVISION DATE:** July 9, 2012