ME 6704: Mechanics of Machinery  
Fall Semester, 2015  
Course Outline

Instructor:

Professor Ashok Midha  
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Office Hours:

Open office hours: By availability and/or by appointment

Texts and Notes:


2. Supplementary Handouts: additional material provided to facilitate course teaching

3. Representative References:

Prerequisites:

Vector and matrix analysis; planar kinematic and dynamic analysis of mechanisms, and strength of materials – linear deformation and stresses in beams; ME 5704 (Compliant Mechanism Design) or consent of instructor; and ability to handle computer project assignments.

Grading:

- Homework: Weekly or biweekly assignments (20%)
- Projects: 2 to 3 projects (computer usage emphasized) (30%)
- Exams: 1 midterm take-home exam (25%)  
1 final take-home exam (25%)

The exam format and dates will be determined in concurrence with students enrolled in the class.
Course Objective:

Selected topics will be covered in machine analysis and design for high-speed applications. Emphasis will be placed on design implications in the presence of elastically deformable mechanism elements.

Brief Course Description:

Rigid-body kinematics, dynamics and synthesis of mechanisms, with emphasis on high performance mechanisms; cam-follower mechanisms; review of compliant mechanisms and pseudo-rigid-body models, and advanced topics, e.g. mechanical advantage; transient and steady-state vibration response; and parametric instability in mechanical systems.

Nature of Design Content:

The course briefly reviews and introduces the necessary engineering science background in planar kinematic and dynamics analysis of mechanisms, and linear beam theory, with the purpose of covering advanced topics in modeling for machine analysis and design, as well as compliant mechanisms, and introducing methods for their synthesis. Emphasis on high performance mechanisms is made whenever possible. Several design related problems are introduced as part of homework, project and exam.

Given below are estimates for the engineering science and design contents of the course:

- Engineering Science: 60%
- Engineering Design: 40%