

AME 339 - Kinematics and Dynamics of Machinery  
**Syllabus**

**Instructor:** Michael M. Stanišić

**Course Catalog Data:** Kinematic and dynamic analysis of machinery,  
with design applications.

**Textbook:** *Notes on Mechanism Analysis*, A.S. Hall, 1974.

**Goals:** After completing this course, students should be capable of predicting the kinematic and dynamic behavior of conventional planar machinery for the purpose of predicting a system's time response as well as the forces within links and forces of interaction.

**Topics:**

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|----|--|-------------|
| 1. | Introduction and Course Policies   | 1 lecture   |
| 2. | Gruebler and Grashof criteria, limit positions, time ratio and dead positions, graphical methods | 2 lectures  |
| 3. | Vector loop method for kinematic analysis  | 11 lectures |
| 4. | Force analysis, friction in joints   | 11 lectures |
| 5. | Dynamic Response - Differential eqn. of motion/Power Eqn.  | 5 lectures  |
| 6. | Theory of Meshing, simple/planetary/compound gear systems. Transmissions and differentials.      | 7 lectures  |

**Computer Usage:**

1. Homework assignments in topics 3, 4, and 5 require a program to solve.
2. Class project(s) typically require a computer simulation of the motion and associated forces within a machine.

**Practice and Assessment Methods:** A large number of homework problems are assigned, graded and returned in each topic. Students can judge their understanding of the material from their homework performance. Solution to homework problems are available from the instructor. There are three semester exams, a final exam and at least one project. A weekly recitation hour is used to work and discuss example problems.

**ABET Content:** Engr. Science 1.5 credits  
Engr. Design 1.5 credits

**Prepared by:** M.M. Stanišić

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