

**University of Arkansas - Fort Smith
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General Syllabus

MEEG 21003 Introduction to Machine Analysis

Credit Hours: 3

Lecture Hours: 3

Laboratory hours: 0

Prerequisite: PHYS 20303 University Physics I, MEEG 20003 Engineering Statics, MEEG 20041 CAD for Engineering

Effective: 2021-2022

I. Course Information

A. Catalog Description

Introduction to kinematics and kinetics of mechanisms, static and dynamic forces, gears and cam design and analysis.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Solve for the velocities of planar systems using graphical, analytical and computer methods.
2. Solve for the accelerations of planar systems using graphical, analytical and computer methods.
3. Write a complete static and dynamic force analysis using graphical, analytical and computer methods.
4. Design a planar mechanism to achieve a certain desired output.
5. Determine the position, velocity and acceleration of a cam using both graphical and computer methods.
6. Solve basic calculations related to involute, epicyclic and nonstandard gearing.

B. University Learning Outcomes

Introduction to Machine Analysis enhances student abilities in the following areas:

Analytical Skills**Critical Thinking**

Students will analyze various mechanical systems through the solution of position, velocity, acceleration and force. Student's will implement multiple solution techniques.

Quantitative Reasoning

Students will create mathematical, graphical and computer models of mechanical systems. The numerical results of their simulations will be used for mechanical design.

III. Major Course Topics

- A. Motion analysis
- B. Graphical analysis
- C. Computational dynamic analysis
- D. Cams, gears
- E. Linkages
- F. Position synthesis