

University of Arkansas – Fort Smith

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General Syllabus

MEEG 2103 – Introduction to Machine Analysis

Credit Hours: 3

Lecture Hours: 3

Laboratory hours:

Prerequisites: PHYS 2903 – Engineering Physics, ENGN 2753 – Engineering Statics, CADD 1302 – Graphics for Engineers

Effective Semester: Spring 2009

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 – Students will analyze various mechanical systems through the solution of position, velocity, acceleration and force. Student’s analytical skills will be enhanced through the implementation of multiple solution techniques. Students will identify a problem and choose an appropriate solution technique.

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.

Technological Literacy – Students will use modern engineering tools such as 3D CAD modeling and dynamic analysis software.

II. Major Course Topics

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