

**The University of Texas at Tyler**  
**College of Engineering and Computer Science**

**MENG 2302 – Dynamics (Required)**

**Syllabus**

**Catalog Description:**

Analysis of the kinematics and kinetics of particles, systems of particles, and rigid bodies. Three hours of lecture per week.

**Prerequisites:** CENG 2301, MATH 2414

**Credits:** 3 ( 3 hours lecture, 0 hours laboratory per week )

**Text(s):** Hibbeler, Engineering Mechanics: Combined Statics and Dynamics, 11th. Edition, Pearson Prentice Hall, 2007

**Additional Material:** Course handouts, MATLAB material

**Course Coordinator:** M. Sathyamoorthy

**Topics Covered:**

Kinematics of particles; rectilinear and curvilinear motion; relative motion. Kinetics of particles: Newton's second law, work and kinetic energy, impulse and momentum methods. Kinematics of rigid bodies: planar and three-dimensional. Kinetics of rigid bodies: planar and three-dimensional; Newton's second law, work and kinetic energy, impulse and momentum methods.

**Evaluation Methods (only items in dark print apply):**

1. Examinations
2. Homework
3. Report
4. Computer Programming
5. Project
6. Presentation
7. Course Participation
8. Peer Review

**Course Objectives<sup>1</sup>:** By the end of this course students will be able to:

1. Set up and solve particle kinematics problems using rectilinear and curvilinear, planar and three-dimensional, coordinate systems. [1-3]
2. Set up and solve kinetics of particles problems, planar and three-dimensional, using Newton's second law, work and energy, and impulse and momentum methods. [1-3]
3. Set up and solve kinematics of rigid bodies problems in planar coordinate systems. [1-3]
4. Set up and solve kinetics of rigid bodies problems using Newton's second law, work and energy, and impulse and momentum methods. [1-3]

<sup>1</sup>Numbers in brackets refer to method(s) used to evaluate the course objective.

Relationship to Program Outcomes (only items in dark print apply)<sup>2</sup>: This course supports the following Mechanical Engineering Program Outcomes, which state that our students will be able to:

1. apply science, mathematics, and modern engineering tools and techniques to identify, formulate, and solve engineering problems. [1 – 4]
2. design thermal/fluid, mechanical, and electro-mechanical components or systems, individually or on interdisciplinary teams, and effectively communicate those designs in both technical and non-technical forums.
3. collect, analyze, and interpret data from prescribed and self-designed experimental procedures and formally communicate the results.
4. apply a broad-based educational experience to understand the interaction of engineering solutions with contemporary business, economic, and social issues.
5. recognize that ethical behavior and continuous acquisition of knowledge are fundamental attributes of successful mechanical engineering professionals.
6. pass the Fundamentals of Engineering exam. [1 - 4]

<sup>2</sup>Numbers in brackets refer to course objective(s) that address the Program Outcome.

Contribution to Meeting Professional Component: (in semester hours)

Mathematics and Basic Sciences:		hours
Engineering Sciences and Design:	3	hours
General Education Component:		hours

Prepared By: M. Sathyamoorthy

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