SYLLABUS
MENG 2213-101: Dynamics
(Required Course)
Fall 2022

Instructor: Dr. Pranaya Pokharel

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Office Hours: MWF 9:00 AM -9:50 AM; R 10:00 AM-11:50 AM; Other days and times by appointment.

Course Schedule: MWF 8:00-8:50 AM

Location: MY 207 (McCoy Engineering Hall 207)

CATALOG DESCRIPTION
Kinematics and kinetics of particles and rigid bodies in plane motion. Work-energy and impulse-momentum principles.

COURSE PRE-REQUISITES
MENG 2113

REQUIRED TEXTBOOK
Engineering Mechanics Dynamics, 15th Edition, R. C. Hibbeler, PEARSON.

TOPICS COVERED
- Introduction and Kinematics of a Particle (HW 1-4, and *Quiz 1*)
- Kinetics of a Particle: Force and Acceleration (HW 5)
- Kinetics of a Particle: Work and Energy (HW 6, and **Mid-term Exam 1**)
- Kinetics of a Particle: Impulse and Momentum (HW 7)
- Planar Kinetics of a Rigid Body (HW8, and *Quiz 2*)
- Planar Kinetics of a Rigid Body: Force and Acceleration (HW9, and **Mid-term Exam 2**)
- Planar Kinetics of a Rigid Body: Work and Energy (HW10)
- Planar Kinetics of a Rigid Body: Impulse and Momentum (HW11)
- Course Review (**Final Exam on December 7**)

Additional material may be covered as time permits.

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SPECIFIC GOALS OF INSTRUCTION

Table 1: A detailed list of course objectives matched with the ABET outcomes (1-7).

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Specific Outcomes of Instruction	*Student Outcomes*						
	1	**2**	**3**	**4**	**5**	**6**	**7**
Given a relevant problems, students will specify rectilinear and curvilinear motion of a particle (assignment, exams).	X						
Given a relevant problem, students will specify particle equations of motion (assignment, exams).	X						
Given a relevant problem, students will specify particle system equations of motion (assignment, exams).	X						
Given a relevant problem, students will specify rigid body equations of motion (assignment, exams).	X						
Given a relevant problem, students will specify work-energy relationships for particles and/or rigid bodies (assignment, exams).	X						
Given a relevant problem, students will specify impulse-momentum relationships for particles and/or rigid bodies (assignment, exams).	X	X				X	
Given a relevant problem, students will determine kinematic behavior of particles and/or rigid bodies with respect to a rotating coordinate system (assignment, exams).	X						

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***Table 2:** Detailed descriptions of the ABET outcomes (1-7) listed in Table 1.

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ABET Outcome	DESCRIPTION
1	an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
2	an ability to apply engineering design to produce solutions that meets specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors.
3	an ability to communicate effectively with a range of audiences.
4	an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgements, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts.
5	an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
6	an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.
7	an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

CONTRIBUTION OF COURSE TO PROFESSIONAL COMPONENT
This course contributes to the engineering science component of the Mechanical Engineering program.

COURSE ORGANIZATION AND ASSESSMENT

- **Course Format**
  This course consists of three 50 minute sessions each week. Class time will be used to introduce concepts and apply these to relevant problems. Lectures will not be used to communicate the entire course content and thus, you will have to study some of the course materials on your own.

- **Class Attendance**
  You are expected to attend class regularly and are responsible for notes, homework assignments, quizzes, and exams missed while being absent. More than **5 times** absences without decent excuses will lead the students' failure.

- **Student Attitude**
  Once class starts, the use of cell phones, reading newspapers, conducting private discussions, using the computer (unless asked by your instructor), working on anything that is not directly related to the course, and making derogatory remarks about your classmates or instructor will not be accepted and may result in your dismissal from the class.

- **Late Assignments**
  All homework assignments will be due at the beginning of the class period listed as the due date. They can be submitted online as well by the due date. Points will be deducted for late submissions. If assignment is submitted after the solutions are provided, it will be graded only for 60% of total points.

- **Evaluation Method**
  Your performance will be tested regularly throughout the semester by in-class quizzes, exams and several homework assignments. There will be homework assignments for discussed chapters, two quizzes, and three exams. While several homework problems may be assigned as part of each homework assignment, it may be the case that only a subset of problems will be graded. However, you must attempt all problems. <u>Do not</u> try to guess which (if any) problems will not be graded.

- **Course Grade**
  The final grade for the course will be based on the scores of exams, quizzes, and homeworks. Two of the lowest homework scores will be dropped ***unless the instructor states that a particular assignment may not be dropped***. Mid-term exams I & II account for 20% each of the course grade, final exam account for 30% of the course grade, the Quiz scores accounts for 15% of the course grade, the homework assignments account for 10% of the course grade, and attendance accounts for 5% of the course grade. The overall average score (X) for the course is determined as follows: $X = 0.2\times$ (Mid-term Exam1 score% + Mid-term Exam2 score%) + $0.30\times$ (Final Exam score%) + $0.15\times$ (Quiz score average%) + $0.10\times$ (homework average%)+$0.05\times$ (Attendance and participation%).

GENERAL GUIDELINES
- Plan on spending appropriate time outside of class each week to study the material and to work on homework assignments. Do not wait until the last day to start the homework or to prepare for the exams.
- <u>Read the course material before coming to class.</u>
- Utilize the office hours throughout the semester.
- Although you are strongly encouraged to study in group, you must work individually when you solve homework problems.

GENERAL EDUCATION STATEMENT
Students in this course must demonstrate their proficiency in oral and written communication through written homework assignments and exams, and solving problems on the board. They must also demonstrate their ability to use the English language.

ACADEMIC INTEGRITY POLICY
<u>Scholastic dishonesty will not be tolerated and will be prosecuted to the fullest extent.</u> You are expected to have read and understood the current issue of the student handbook regarding student responsibilities & rights, and the intellectual property policy information about procedures and what constitutes acceptable on-campus behavior. More details can be found at https://msutexas.edu/student-life/_assets/files/handbook.pdf

The Grade Appeal Checklist provides the timeline for appealing from the instructor to the next in line (dean of the college). The Academic Honesty Checklist describes the timeline for appealing from the instructor to the next in line (chair of department) and who must be notified of academic honesty infractions.

CONFLICT RESOLUTION
- The student should contact the instructor face to face or via e-mail if there is an issue with the course or the instructor. The faculty and the student will discuss this face to face or via email. Hopefully a resolution is reached on the issue.
- The student should notify the faculty via email again if the issue still did not get resolved after the first encounter or communication.
- The student can then contact the Chair of the McCoy School of Engineering, Dr. Desai, face to face or via email, (raj.desai@msutexas.edu), and discuss this issue. Dr. Desai will discuss the issue at hand with the faculty member. Dr. Desai will discuss the result of this discussion with the student. Hopefully a resolution is reached on the issue after this.
- The student should notify the Chair via email if the issue still did not get resolved.
- The Chair will contact the Dean and try to resolve the conflict. In case the conflict deals with the student grade, she will forward the case to the Grade Appeals Committee if necessary.

DISABILITY SUPPORT SERVICES
If you have a documented disability that will impact your work in this class, please contact me to discuss your needs.

DISCLAIMER STATEMENT
Information contained in this syllabus other than grading policies, may be subject to change with advance notice, as deemed appropriate by the instructor.

CAMPUS CARRY STATEMENT
Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit Campus Carry.

ACTIVE SHOOTER STATEMENT
The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit Safety / Emergency Procedures. Students are encouraged to watch the video entitled "*Run. Hide. Fight.*" which may be electronically accessed via the University police department's webpage: *"Run. Hide. Fight."*

Student Resources https://msutexas.edu/academics/scienceandmath/student_resources.php

Prepared by: Pranaya Pokharel, Date: 08/20/2022