

PHY 202

DYNAMICS

3 cr. (3-0)

**COURSE DESCRIPTION:**

A continuation of PHY 201. Methods of elementary classical mechanics as applied to particles and rigid bodies in nonequilibrium situations. Vector algebra is used extensively and some vector calculus is introduced. A programmable calculator is strongly recommended for the course. This course is currently offered in the spring semester.

**PREREQUISITES:** PHY 201**COURSE OBJECTIVES:**

1. Solve problems involving the geometry of the motion of either particles or rigid bodies.
2. Solve problems involving either particles or rigid bodies in nonequilibrium situations under a system of forces.
3. Solve problems involving either the undamped or damped, free or forced vibration of a rigid body using either the equations of motion or energy methods.

**COURSE OUTLINE:***Kinematics and Kinetics of a Particle*

Chapter 12:	Kinematics of a Particle
Chapter 13:	Kinetics of a Particle: Force and Acceleration
Chapter 14:	Kinetics of a Particle: Work and Energy
Chapter 15:	Kinetics of a Particle: Impulse and Momentum

*Planar Kinematics and Kinetics of a Rigid Body*

Chapter 16:	Planar Kinematics of a Rigid Body
Chapter 17:	Planar Kinetics of a Rigid Body: Force and Acceleration
Chapter 18:	Planar Kinetics of a Rigid Body: Work and Energy
Chapter 19:	Planar Kinetics of a Rigid Body: Impulse and Momentum

Chapter 22: Vibrations

Optional sections (\*) in the above chapters may be omitted to adjust the length of the course.

## **COURSE REQUIREMENTS:**

1. Regular attendance. (See *Attendance Policy* below)  
*Roll will be taken.* Students are expected to attend all scheduled class periods for the courses in which they are enrolled unless they are participating in a scheduled, supervised College trip or function (*Rights & Responsibilities: A Student Code of Conduct*, John A. Logan College.)

Tardiness (not present at the time roll is being taken), being disrespectful to both the instructor and the class, is *strongly discouraged*. A student will be considered absent if not present when his/her name is called during roll. **Arrive on time!**

2. Reading and thoroughly understanding the assigned chapters of the text. The text material must be read **before** the lecture over the same. **COME TO CLASS PREPARED!**

3. Working the assigned daily homework sets. Typically, homework will be assigned during each class period and collected at the *beginning* of the following class period. It will be spot-checked and returned before the test so that the student may study from it.

- a. All work must be done in pencil.
- b. All answers should be boxed and have the correct accuracy and units.
- c. Late homework will not be accepted.
- d. Partial credit will generally *not* be given for wrong solutions.
- e. *No credit* will be given if your answer is correct but:
  - (1) No work is shown.
  - (2) Your work (and associated sketches/diagrams) is not *neat, clear* and *organized*,
  - (3) All intermediate work is missing: i.e., your work includes only a final equation with the correct numbers in it and your final answer. *All the work leading to your answer must be shown.*
- f. If you are unable to work the problem, place the problem number with a blank beside it.
- g. The author's and/or instructor's solutions to the assigned homework will be available at my office after the homework is picked up.
- h. To prepare for tests, it is recommended that the student work as many extra end-of-the-chapter and web site problems as possible.
- i. It is NOT possible to do well in this course without *doing ALL the assigned homework and doing it well!* Consequently, the homework grade *will be based on both quantity of problems completed and correctness of work.*

4. Chapter Tests based on your text reading, and homework, lecture and text examples. Problems will occasionally be taken from problems listed on the web site for the text ([www.prenhall.com/hibbeler](http://www.prenhall.com/hibbeler)). These tests *will be both quantitative and conceptual/qualitative*. (Partial credit will be given on these tests if your work is clear and "in the right direction").

Note: A 1 page (*ONLY*) formula sheet may be used for each test. This must be *handwritten ONLY* and contain *ONLY formulae*. This means no text, no worked out problems, and no outlines of typical problems! I will occasionally check this during the tests to see if it satisfies these requirements.

5. Classroom participation: Students will be expected to answer during classroom discussions questions related to the text reading and to their homework. Questions and problems will be discussed in class. **COME TO CLASS PREPARED!**
6. A comprehensive final exam.
7. Student Success Center. Tutors may be obtained through the Student Success Center. Contact the staff in C219 if this service is desired. John A. Logan College will make reasonable accommodations for students with documented disabilities under Section 504 of the Rehabilitation Act of 1973, and the Americans with Disabilities Act of 1990. Any student with a disability that may have some impact on work in this class, who feels she/he needs an accommodation, should make an appointment with the Coordinator of Services for Students with Disabilities on campus, Jennifer Frost, Room C219B, Ext. 8516. Before services can be provided, this advisor must determine eligibility and arrange appropriate academic adjustments. It is the student's responsibility to register in advance of a school term with this office and to turn in a schedule each term to ensure that there is every opportunity for success in this class.
8. English Writing Center/Tutoring. For assistance with writing assignments in any college course, students are encouraged to visit "The Write Place" in Room E109. English instructors are available for one-on-one tutoring each semester during hours posted at the center.
9. Financial Aid. Students who receive financial assistance and completely withdraw from classes prior to 60% of the semester being completed (approximately 2-3 weeks after midterm) could be responsible to return a portion of their Federal Pell Grant award. Prior to withdrawing from courses, students should contact the Financial Aid Office.
10. Course Withdrawal Information. It is expected that you will attend this class regularly. If you stop attending for any reason, you should contact your advisor and withdraw officially to avoid the posting of a failing grade (an E) to your transcript. It is also advisable to discuss the situation with your instructor before dropping.

**METHOD OF EVALUATION:**

1. *Missed Tests:*
  - a. In the case of an *anticipated* school sponsored activity or **unavoidable** conflict, arrangements may be made **in advance** to take the test *before* the regular test date.
  - b. In the case of a **sudden** illness or **valid** emergency on the day of the test, the test may be made up **before the next class period** *if and only if* I am called *before* the hour of the test and notified of the sickness or emergency.
  - c. *All* other missed tests will receive a grade of zero.
  
2. *Lowest Grade Dropped:*
  - a. The lowest test grade of the semester will be dropped.
  - b. The *first* missed test - **missed for any reason, other than 1a or 1b above** - will count as the dropped grade.
  
3. The *final course grade* will be determined as follows:

Homework	20%
Chapter Tests	60%
Final Examination	20%
  
4. *Letter grades* will be assigned as follows:

A	100 - 88%
B	87 - 77%
C	76 - 66%
D	65 - 55%
E	54 - 0%

**Note 1:** (Due to generous grading scale, individual or course grades will not be curved.)

**Note 2:** Your cumulative, end-of-semester percentage grade is on the line between letter grades, your final course letter grade will depend on your class participation.

**Note 3:** You must have a passing grade for the homework to pass the course.

**METHOD OF PRESENTATION:**

Lecture-discussion with occasional demonstrations, 3 hours per week

**TEXT:**

Engineering Mechanics: Dynamics, 11<sup>th</sup> Ed., by R.C. Hibbeler or  
Engineering Mechanics: Statics and Dynamics, 11<sup>th</sup> Ed. by R.C. Hibbeler  
 (combined 2-semester edition)

**Supplementary Text and Resources**

Workbook and Study Guide

Web Site ([www.prenhall.com/hibbeler](http://www.prenhall.com/hibbeler)) (contains sample multiple-choice and true-false tests for each chapter, with answers).

(These are excellent resources and are described on pg. xi of the *Preface* of the text.)

**Required Materials:**

Ruler, protractor, and scientific calculator (preferably programmable but not required).

**INSTRUCTOR:** Dr. Mike Morgan  
 E-mail: [mikemorgan@jalc.edu](mailto:mikemorgan@jalc.edu)

**DATE:** Spring, 2009

**John A. Logan College Telephone Numbers**

Carterville and Williamson County.....	985-3741 (operator)
	985-2828 (direct extension access)
Carbondale and Jackson County .....	549-7335 (operator)
	457-7676 (direct extension access)
Du Quoin .....	542-8612
West Frankfort.....	937-3438
Crab Orchard, Gorham, & Trico areas .....	1-800-851-4720
TTY (hearing-impaired access) .....	985-2752

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