COURSE OUTLINE	PHYSICS 111	Fall 2015

Instructors:
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Course WWW page: https://web.njit.edu/~tyson/physics111.html

Office Hours: Friday 5:00-6:00 PM

PREREQUISITE: Math 131 (if not originally placed in Math 111).
COREQUISITE: Math 111 or Math 132, Phys 111A.

**FAILURE TO MEET EITHER CO-Requisites or PRE-Requisites will result in student being dropped from class.**

COURSE MATERIAL:

- **Textbook**_: Sears and Zemansky's University Physics with Modern Physics_, 13th Edition Technology Update, by Young and Freedman. The publisher is PEARSON. NOTE: This textbook will be used for Phys 121 and Phys 234 as well.

- **Classroom Response System** called **"iClickers":** "IClickers" will NOT be used in this section. For each week, there will be a quiz covering details from the previous week.

- **Mastering Physics Homework System:** Be sure that your textbook is sold bundled with a Mastering Physics student access code card. Each student must enroll in the course specified by his/her instructor. Homework assignments will be posted on-line. Students login, download and solve the assigned problems, and submit answers to the automated grading system.

NOTE: THE LABORATORY COURSE, PHYS 111A, MUST BE TAKEN CONCURRENTLY WITH PHYS 111. THE STUDENT MUST REGISTER FOR BOTH THE LEC/REC AND THE LAB COURSE. WITHDRAWAL FROM EITHER COURSE WILL CAUSE A SIMULTANEOUS WITHDRAWAL FROM BOTH COURSES.

ATTENDANCE: It is expected that students will attend all lectures and recitations. Attendance will be taken at all classes and exams. More than 3 unexcused absences (in total) are excessive. If you have excusable absences contact your instructor or the Dean of First Year Students. If you must withdraw from the course, do it officially through the Registrar. Do not simply stop attending and taking exams: that forces the instructor to assign a course grade of "F".

HELP: Visit or email your instructors if you are having trouble with the course; do not simply hope for a miracle and fall further behind. The Physics Dept. office on the 4th floor of Tiernan has specific information on tutoring. Physics tutoring is available through the CAPE organization, and possibly elsewhere.

GRADING: Your final letter grade in Phys 111 will be based on a composite score for term's work that includes the common exam scores, the final exam, lecture quizzes or Iclickers, and the homework score.

1) Common Exams   Three common exams will be given during the semester. The exam schedule is:

- **Common Exam 1: Monday, September 28th   4:15 — 5:45 PM**
- **Common Exam 2: Monday, October 26th   4:15 – 5:45 PM**
- **Common Exam 3: Monday, November 23rd   4:15 – 5:45 PM**

In-class I-Clicker Questions/quizzes covering the preceding or current work may be given during lectures and/or recitations. Those scores count toward your final course grade. **There are no make-ups for in class activities**. Students missing an I-Clicker question/ quiz will receive a grade of zero for that item. The general policy is that students who miss a common exam will receive a score of zero for that Exam. That score will be included in the calculation of your final grade. Students that miss two common

exams automatically fail the course. Students who anticipate an absence from a common exam should discuss their situation with their instructor PRIOR TO their absence. In order to be qualified to receive a "make-up" common exam score (a very rare occurrence), the student should present documentation for not being able to take the test as scheduled. As is the standard policy of NJIT, this documentation should be presented to the student's Physics 111 instructor AND to the Dean of Students - (973) 596-3466, Room 255 Campus Center. BOTH the Physics 111 instructor and Dean of Students must concur in permitting a "make-up" common exam. Students who miss common exams that do not present documentation within 7 days of the common exam will receive a score of zero for the common exam.

In the event that the above qualification is met, a separate make-up test for the missed common quiz will not be offered. Instead, the portion of the final exam relevant to the contents of the missed test will be considered for giving a grade for the missed test. The instructor will evaluate the final exam questions from those chapters and normalize this portion of the student's grade for the missed common quiz.

2) Lecture Quizzes   A short quiz/ Iclicker questions will be given during each lecture period.

3) Homework   Homework assignments will be posted on-line using the Mastering Physics Homework System. Your instructor will announce the ID number for your course section. For Prof. Tyson's section, please register for **"MPTYSON30252".** You will need it when you set up your login on the Mastering Physics web site and enroll in your section of the course. Please register for the correct section. login: [www.masteringphysics.com.](www.masteringphysics.com) Homework due dates will be announced. The recommended problems from the text (see syllabus) will be discussed during the recitation class.

4) Final Exam   **Comprehensive Final Exam will be given** during Final Exam Period (May 8-14).

Final Letter Grades: Here are the approximate weights to be used for calculating the composite score:

- **51%** for all three common exams (17% each)
- **29%** for the final exam
- **12%** for the total of homework work
- **8%**   for the all in-class quizzes/ Iclickers

The cutoff percentages for various letter grades will be in the range of 85% for A, 80 % for B+, 70% for B, 65% for C+, 55% for C, and D or F below 50 %. Final grades are not negotiable: A score of 84.999999% is a B+, not an A.

HONOR CODE STATEMENT: NJIT has a zero-tolerance policy for cheating of any kind and for student behavior that disrupts learning by others. Violations will be reported to the Dean of Students. The penalties range from a minimum of failure in the course plus disciplinary probation up to expulsion from NJIT. Avoid situations where your own behavior could be misinterpreted as dishonorable. **Students are required to agree to the NJIT Honor Code on each exam, assignment, quiz, etc. for the course.**

Turn off all cellular phones, wireless devices, computers, and messaging devices of all kinds during classes and exams. Please do not eat, drink, or create noise in class that interferes with the work of other students or instructors.   Creating noise or otherwise interfering with the work of the class will not be tolerated.

LEARNING OUTCOMES: For this course, which is the second of the introductory Physics series, you can expect to be assessed on the following learning outcomes:

1. Manipulate vectors in components form and as magnitude/direction. Perform vector operations such as addition, subtraction, scalar, and cross products.
2. Recall the definitions and relationships involving position, velocity, speed, acceleration.
3. Apply the equations governing 1-D constant acceleration to mechanical systems for various initial conditions.
4. Apply the equations governing 2-D constant acceleration to mechanical systems for various initial conditions.
5. Comprehend the meaning of the equations governing net force and acceleration (Newton's Laws) for linear motion, and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship.
6. Understand the extension of free-body diagrams and Newton's laws to rotational motion.
7. Understand the extension of free-body diagrams and Newton's laws to frictional forces.
8. Comprehend the definitions and application of work, energy, and conservation of energy principles to solving mechanical and non-conservative systems.
9. Comprehend the meaning of equations governing momentum, impulse, and collisions. Apply the equations governing momentum, impulse, and collisions mechanical systems for various initial conditions. Understand under what conditions momentum is conserved and how to use this relation to calculate unknown quantities based on physical relationships, initial conditions, and known quantities.
10. Define and calculate the center of mass of a system as well as the moment of inertia.
11. Extend the concepts and equations of 1-D constant acceleration to rotational motion for various initial conditions.
12. Understand the extension of linear motion equations to rotational motion. Comprehend the meaning of the equations governing rotational motion and acceleration, and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship.

13. Understand the extention of work, energy, and conservation of energy principles to rotational motion.
14. Recall the definitions of angular momentum. Apply this concept to conservation of angular momentum.
15. Apply concepts of Newton's Laws to equilibrium of linear and rotational motion.
16. Understand the extension of conservation of energy and mass equations to fluid dynamics.
17. Understand the extension of Newton's Laws and energy concepts to gravitation.

Syllabus

TOPIC	TEXT STUDIES	RECOMMENDED PRACTICE PROBLEMS
Week 1 Units, Physical Quantities, and Vectors	Chapt.1	pg. 28 - 3, 6, 14, 21, 29, 39, 43, 46, 48, 73
Week 2 Motion in One Dimension	Chapt. 2	pg. 60 – 4, 7, 15, 20, 25, 38, 44, 80
Week 3 Motion in Two Dimensions	Chapt. 3	pg. 96 – 4, 7, 12, 19, 24, 26, 35, 47, 56, 57
Week 4 Newton's Laws of Motion	Chapt. 4	pg. 128 – 4, 10, 17, 21, 28, 32, 43, 46
Week 5 Applying Newton's Laws	Chapt. 5	pg. 163 – 2, 4, 10, 13, 17, 28, 42, 46, 54, 68
Week 6 Work, Kinetic Energy	Chapt. 6	pg. 198 - 7, 15, 21, 37, 46, 50, 56, 75, 86
Week 7 Potential Energy, Conservation of Energy	Chapt. 7	pg. 232 – 2, 5, 9, 15, 23, 30, 37, 38, 42, 45, 55
Week 8 Linear Momentum and Collision	Chapt. 8	pg. 268 - 6, 8, 19, 21, 25, 41, 43, 48, 55, 62
Week 9 Rotation, Moment of Inertia	Chapt. 9	pg. 299 - 3, 11, 18, 25, 30, 40, 49, 54, 60, 87
Week 10 Dynamics of Rotational Motion	Chapt. 10 – Sections 1-6	pg. 334 – 1, 8, 9, 17, 26, 33, 36, 42, 49, 67, 70
Week 11 Static Equilibrium	Chapt. 11 – Sections 1-3	pg. 361 – 2, 5, 14, 19, 20, 46, 49, 60
Week 12 Fluid Mechanics	Chap.12 – Sections 1-5	pg. 394 – 3, 8, 10, 21, 26, 31, 37, 44, 59, 91, 94
Week 13 Universal Gravitation	Chap. 13	pg. 429 – 5, 6, 13, 15, 18, 22, 24, 32, 37

Sept. 7, Labor Day
Tuesday Sept. 8: Monday Classes Meet
Nov. 2, LAST DAY TO WITHDRAW!
Wednesday Nov. 25: Friday Classes Meet
Nov. 26-29, Thanksgiving Recess
Dec. 10, Last day of classes
Dec. 11-14, Reading day!
Dec. 15, FINAL EXAM BEGINS