Physics 102 Summer I, 201 Course Syllabus

M 1-4, TWR 1-3  T105

Instructor:

- Dr. Reginald C. Farrow, reginald.farrow@njit.edu, (973) 596-2473, 457 Tiernan,
  Office hours: Tuesday, Thursday 11-12:30 Or after class or by appointment (send e-mail).

Pre-requisites and Co-requisites:

- Satisfactory completion of two high school mathematics courses.

Physics 102A Laboratory: TWR 3-5
The lab is totally separate course from the lecture.
If the laboratory is required, it must be taken concurrently unless you have previously taken and passed Phys 102A.
The grading for the laboratory is separate from the lecture/recitation (Phys 102). Lab instructors set the requirements and grades.

Course Materials for Physics 102:

- Primary text:
  “Physics: Principles with Applications, 7th edition” by Douglas C. Giancoli, Prentice Hall,
  Paper copy is available. An electronic copy can also be purchased or rented.

  This textbook contains both Physics 102 and Physics 103

- Homework is online at the MasteringPhysics.com web site. Registration details are on next page.

- The MasteringPhysics.com website (accessible if you purchase a key with the textbook) has additional help.

Examinations: There will be two exams and a comprehensive Final Exam. Normally there will be no make-up exams. See the below syllabus for a schedule of and material covered on the exams.

In-Class quiz: In-class quizzes covering the preceding day’s work will be given during lectures. The grades count toward your final course grade. There will be no make-up quizzes.

Final Grades will be based on a composite score for the term’s work that includes each common exam score, the final exam, in-class quizzes, and the term’s homework score. Here are the approximate weights to be used for calculating the composite score:

- 20% -- each Exam 1+2
- 35% -- final exam
- 15% -- homework
- 10% -- lecture quiz

Composite score: 0.2(Exam 1) + 0.2(Exam 2) + 0.3(Final) + 0.15(Hwk av) + 0.10(lecture quiz av)

Letter grade is assigned as follows:

A >80  B+ 75-79  B 70-74  C+ 65-69  C 55-64  D 50-54  F < 50
Homework: It is impossible to succeed in any science course without working a lot of problems. Do the homework. Remember that homework is 15% of your final grade.

- We cover approximately one major topic with problems each day in lecture class. The related homework assignments are due either two days later or on the Monday of the following week. You will be sent detailed solutions after the assignment is due. We can spend some time going over homework questions in class. You can work in study groups to do homework.

- Read the assigned sections of the text before the lecture covering that material.

- Remember that doing as many problems from the end of the chapter is important to understanding and using the material.

REGISTRATION for homework on MasteringPhysics:

MPFARROW78413

Attendance will be taken daily. More than 3 unexcused absences is excessive. If you withdraw from the course, do it officially through the Registrar. Remember that attendance shown by your in-class quiz grade, is 10% of your final grade.

Help: Visit or email your instructor if you are having trouble with understanding the course material. Do not simply hope for a miracle and fall further behind. Tutoring is also available from the Physics department Tuesday and Thursdays 10:30am - 12:30pm in 413 FMH

Honor Code Violations or Disruptive Behavior: 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.

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.

Learning Outcomes:

For this course, you can expect to be assessed on the following learning outcomes:

1. Recall the definitions and relationships involving position, velocity, speed, acceleration, vectors, Newton’s Laws, circular motion, free-body diagrams, friction, work, energy, linear and angular momentum, torque, angular velocity and acceleration, and gravitation.
2. Apply the equations governing 1-D and 2-D constant acceleration to mechanical systems for various initial conditions. Calculate unknown quantities based on physical relationships, initial conditions, and known quantities.
3. Comprehend the meaning of the equations governing net force and acceleration (Newton’s Laws), and be able to manipulate them in conjunction with a free-body diagram to obtain any desired quantitative relationship. Understand the extension of these equations to rotational motion, and gravitation.
4. Generalize the concepts underlying the equations of motion, such as work, kinetic and potential energy, conservation of energy, and equilibrium.
5. 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.
6. 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.

Next Page: List of Topics and schedule
### Assignments for Summer 2018 - Physics 102

<table>
<thead>
<tr>
<th>Weeks and Lecture Topics</th>
<th>Text Readings</th>
<th>Homework</th>
<th>Lab</th>
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| **Week 1 – Monday 5/21 (3 Hours)**  
Math review, Units, Basic Motion Definitions | Ch 1, Sec 1-6 | Begin HW 0 |   |
| **Week 1 -- Tuesday 5/22**  
Motion in One Dimension | Ch 2, Sec 1-8 | Begin HW 1  
HW 0 due 5/22 | Intro |
| **Week 1 -- Wednesday 5/23**  
Vectors and Two-Dimensional Motion | Ch 3, Sec 1-6 | Begin HW 2 | 104 Motion Graph |
| **Week 1 – Thursday 5/24 (3 Hours)**  
The Laws of Motion - Forces and Newton’s Laws | Ch 4, Sec 1-5 | Begin HW 3  
HW 1 due 5/24 | 109 1-D Motion |
| **Week 2 – Tuesday 5/29**  
Friction—Applications of Newton’s Laws | Ch 4, Sec 6-8 | Begin HW 4,  
HW 2, 3 due 5/29 | 111 Projectile Motion |
| **Week 2 -- Wednesday 5/30**  
Friction, More on Forces, Free Body Diagrams | |   | 112 Newton’s 2nd Law |
| **Week 2 -- Thursday 5/31**  
Review for Exam 1 | Ch 1-4 | HW 4 due 5/31 | 113 Atwood’s Machine |
| **Week 3 -- Monday 6/4 (3 Hours)**  
Review for Exam 1 | Ch. 6, Sec. 1-7, 9, 10 | Begin HW 5 |   |
| **Week 3 -- Tuesday 6/5**  
Exam 1 – [Ch 1-4, NOT including friction] | | Begin HW 6 | 106 Friction |
| **Week 3 -- Wednesday 6/6**  
Momentum and Collisions - Momentum, Impulse, Conservation of Momentum | Ch. 7, Sec. 1-3 | Begin HW 7  
HW 5 due 6/6 | 122 Energy / Inclined Plane |
| **Week 3 -- Thursday 6/7**  
Momentum and Collisions - Collisions | Ch 7, Sec. 4-8, 10 | Begin HW 8  
HW 6 due 6/7 | 126 Momentum / Impulse |
| **Week 4 -- Monday 6/11**  
Rotational Motion, Rotational Dynamics | Ch 8, Sec 1-4 | HW 7, 8 due 6/11  
Begin HW 9. | 103 Translational Equilibrium |
| **Week 4 -- Tuesday 6/12**  
Rotational Dynamics | Ch 8, Sec 5-8 | Begin HW 10 | 120 Angular Momentum |
| **Week 4 -- Wednesday 6/13**  
Equilibrium | Ch 9, Sec 1-4 | Begin HW 11  
HW 9 due 6/13 | 127N Torque / Rotational Inertia |
| **Week 4 -- Thursday 6/14**  
Review for Exam 2 | Ch. 4(friction), 6, 7 | HW 10 due 6/14 |   |
| **Week 5 -- Monday 6/18**  
Exam 2 – Ch. 4(friction, inclines), 6, 7 -- 1-3:30  
Static Equilibrium | Ch 9 | HW 11 due |   |
| **Week 5 -- Tuesday 6/19**  
Circular motion | Ch 5, Sec 1-4 | Begin HW 12 | 121 Equilibrium / Strut |
| **Week 5 -- Wednesday 6/20**  
The Law of Gravity | Ch 5, Sec 5-8 | Begin HW 13 | 131 Centripetal Force |
| **Week 5 -- Thursday 6/21**  
Review for Final | | HW 12, 13 due |   |

**25 June 2018 (Monday)**  
**FINAL EXAM – 1-4PM**

Ch 1-9
### Summer 1, 2016 Important Dates:

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<tr>
<th>Date</th>
<th>Day</th>
<th>Event</th>
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<tr>
<td>May 21</td>
<td>(Monday)</td>
<td><strong>Summer session begins</strong></td>
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<tr>
<td>May 22</td>
<td>(Tuesday)</td>
<td>100% Refund Ends for Courses</td>
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<tr>
<td>May 27</td>
<td>(Sunday)</td>
<td>80% Refund Ends for Courses</td>
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<td>May 28</td>
<td>(Monday)</td>
<td><strong>Memorial Day – NO CLASS</strong></td>
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<tr>
<td>May 31</td>
<td>(Thursday)</td>
<td>60% Refund Ends for Courses</td>
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<td>June 5</td>
<td>(Tuesday)</td>
<td>40% Refund Ends for Courses</td>
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<td>June 8</td>
<td>(Friday)</td>
<td><strong>20% Refund Withdrawal Deadline</strong></td>
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<tr>
<td>June 25</td>
<td>(Monday)</td>
<td>First Summer Session Classes End – <strong>FINAL EXAM</strong></td>
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