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Summer 2020

## PHYS 102A-450: General Physics Lab

Keun Hyuk Ahn

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INSTRUCTOR	Name: Keun Hyuk “Ken” Ahn, E-mail: kenahn@njit.edu
LAB HOURS VIA WEBEX	1pm-3pm, Tuesdays, Wednesdays and Thursdays
OFFICE HOURS VIA WEBEX	10am-10:25am, 10:30am-10:55am on Fridays (Email instructor by 5pm Thursday with any time constraint you may have.)
TEXTBOOK	Physics 102A Laboratory Manual, 8 <sup>th</sup> Edition, sold by NJIT bookstore at its Website <a href="https://www.bkstr.com/njitstore/home">https://www.bkstr.com/njitstore/home</a>
DESCRIPTION	This general physics laboratory course involves experiments which demonstrate the principles of elementary statics and dynamics including kinematics, Newton's laws of motion, energy, momentum, conservation principles, and rotational motion.
NOTE	In order to take the laboratory course, PHYS 102A, a student must take concurrently the lecture course, PHYS 102 unless the student passed the lecture course previously. Withdrawal from either course will cause a simultaneous withdrawal from both courses.
HELP	<ul style="list-style-type: none"> <li>- Email your instructor if you are having trouble with the lab course;</li> <li>- If you need accommodations due to a disability, please contact Ms. Lyles (Chantonette.Lyles@njit.edu), Associate Director of Disability Support Services, to discuss your specific needs.</li> </ul>
GENERAL INFORMATION	<ul style="list-style-type: none"> <li>- There is no exam in the lab course.</li> <li>- No make-ups for missing labs are allowed.</li> <li>- Grading (A through D and F) is based on attendance, participation and lab report.</li> <li>- Experiments are a group effort.</li> <li>- Laboratory report should be individual one submitted by each student.</li> </ul>
LEARNING OBJECTIVES	<ul style="list-style-type: none"> <li>- Students will master basic physics concepts by performing an experiment relevant to a corresponding course work.</li> <li>- Students will gain hands-on experiences with experimental processes and develop effective written communication skills.</li> <li>- Students should develop collaborative learning skills by working in a group.</li> </ul>
LEARNING OUTCOMES	<ul style="list-style-type: none"> <li>- Students will demonstrate basic experimental skills by the practice of setting up and conducting an experiment.</li> <li>- Students will demonstrate an understanding of the analytical methods required to interpret and analyze results and draw conclusions as supported by their data</li> <li>- Students will demonstrate basic communication skills by working in groups on laboratory experiments and the thoughtful discussion and interpretation of data.</li> </ul>
ATTENDANCE	<ul style="list-style-type: none"> <li>- <b>Students should attend the lab via Webex. Students will receive invitation by email.</b></li> <li>- Attendance policy is very strict. It is a student's responsibility to confirm his/her attendance with Lab instructor.</li> <li>- It is required for students to attend all lab experiments since grading is based on attendance, participation and lab report.</li> <li>- <b>Attendance will be checked via Webex by your instructor. Students should answer by Chat or Mic when his/her name is called.</b></li> <li>- If a student does not appeal and resolve his/her attendance within 7 days, no further complaint will be accepted.</li> <li>- If a student makes more than 3 unexcused absences, the student is very likely to fail the lab course.</li> <li>- If a student has excusable absences, the student should contact the dean of student office to email an official excuse to his/her lab instructor.</li> </ul>
GRADING POLICY	<ol style="list-style-type: none"> <li>1. The grading guidelines are as follows: Attendance (20%); Participation (20%); Laboratory Report (60%)</li> <li>2. A grade of zero (0) will be given for any missed experiment with no excuse.</li> <li>3. Submission of lab report is due the following week class begins – penalty for lateness is 10 % per day.</li> <li>4. Laboratory Report Grading (points): <ul style="list-style-type: none"> <li>- Style; font type, font size, line space, margin, etc. given by your lab instructor (5)</li> <li>- Title (5)</li> <li>- Introduction including Objective and Theoretical Background (5)</li> <li>- Experimental Procedure (5)</li> </ul> </li> </ol>

	<ul style="list-style-type: none"> <li>- Results: Experimental Data (15) and Calculation (15)</li> <li>- Discussion and analysis of results; Answers to questions (40)</li> <li>- Conclusions (10)</li> <li>- Raw Data Sheet (5); unless otherwise instructed, raw data sheets (or photocopies of raw data) should be attached in the lab report. The raw data should be checked and signed by your instructor at the completion of lab experiment.</li> </ul>
<b>LAB REPORT</b>	<b>Files (pdf or Word file) for lab reports should be uploaded on Canvas under Assignments by the due date.</b>
GRADING SCALE	90 - 100 % = A, 85 - 89 % = B+, 80 - 84 % = B, 75 - 79 % = C+, 70 - 74 % = C, 50 - 64 % = D, 0 - 49 % = F

### LAB COURSE SCHEDULE

Day	Date	Experiment	Report due date
1	5/19 (T)	Introduction and Error Analysis	<b>(Solutions for exercises)</b> 11:59pm 5/25 (M)
2	5/20 (W)	Lab 104: Creating Motion Graph	11:59pm 5/25 (M)
3	5/21 (R)	Lab 109: One-Dimensional Motion--Velocity as a Function of Time and Distance at Constant Acceleration	11:59pm 5/25 (M)
4	5/26 (T)	Lab 111: Projectile Motion	11:59pm 6/1 (M)
5	5/27 (W)	Lab 112: Newton's Second Law	11:59pm 6/1 (M)
6	5/28 (R)	Lab 113: Atwood Machine	11:59pm 6/1 (M)
7	6/2 (T)	Lab 106: Static and Kinetic Friction	11:59pm 6/8 (M)
8	6/3 (W)	Lab 131: Centripetal Force	11:59pm 6/8 (M)
9	6/4 (R)	Lab 122: Conservation of Energy for an Object on an Inclined Plane	11:59pm 6/8 (M)
10	6/9 (T)	Lab 126: Conservation of Momentum and Impulse-Momentum Theorem	11:59pm 6/15 (M)
11	6/10 (W)	Lab 127N: Torque and Rotational Inertia	11:59pm 6/15 (M)
12	6/11 (R)	Lab 120N: Conservation of Angular Momentum	11:59pm 6/15 (M)
13	6/16 (T)	Lab 103: Translational Static Equilibrium--- Force Table	11:59pm 6/22 (M)
14	6/17 (W)	Lab 121: Rotational Static Equilibrium --- Forces on a Strut	11:59pm 6/22 (M)

### Physics Laboratory Safety

1. Food and drink are not permitted during class in the lab at any time.
2. Wear safety glasses all the times during lab experiment.
3. Do not come in the lab early unless the instructor is present.
4. Do not wear loose hair or clothing around moving equipment.
5. Do not set equipment too close to the edge of the table.
6. Do not activate any electric circuit or apparatus until the instructor inspect it.
7. Never touch a possibly live circuit and do not touch electrical equipment with wet hands.
8. Only use laboratory equipment for the instructional purpose for which they were intended.
9. Never look directly in the beam of a laser and light from lamp used for experiment.
10. All trash and waste materials should be disposed in the proper container. Do not pour chemicals into the laboratory sink.
11. Do not short the electrical leads on any equipment.
12. Any equipment except computer not in use should be turned off.
13. Do not take apart any apparatus or piece of equipment.
14. All damaged equipment and chemical spills should be immediately reported to a laboratory instructor or a laboratory staff.
15. Accidents and emergencies must be immediately reported to the laboratory instructor. (NJIT Emergency call number: 911)
16. Be aware that fire extinguishers are located in Rooms of 406T and 407T.