Physics 130 (General Physics I)

COURSE AND INSTRUCTOR INFORMATION

Course: PHY 130 (General Physics I), **Section 02**
Lecture Location: Merion 109
Lecture Time: MWF: 12:00 – 12:50 pm

Instructor: Anil K. Kandalam (Dr. Kandalam or Dr. K)
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Office Hours: Monday, Wednesday: 10:30 am – 11:30 am, 1:00 pm – 2:00 pm
Thursday: 1:00 pm – 2:00 pm
Friday: 10:30 am – 11:30 am or by appointment

COURSE DESCRIPTION

PHY130 is the first semester introductory, algebra-based physics seuqence. Topics covered include kinematics (the description of motion), dynamics (how forces affect the motion) of an object, heat and temperature (consequences of molecular motions), thermodynamics, oscillations, and waves. This course, along with the PHY 140, provides an introduction to the fundamental concepts in understanding the physical world.

A good grasp on high-school algebra and trigonometry is pre-requisite for this course. We will be using algebra and trigonometry If you feel that your skills are weak in either of these two areas, please feel free to see me during office hours or by appointment. I am willing to work with you and help you catch up.

REQUIRED COURSE MATERIALS

Textbook: Physics, by Cutnell and Johnson, 9th edition*

Other Required Materials: The Wiley-Plus access code for the text book*
Laboratory Notebook (see lab syllabus for details)
Physics 130 lab manual (available at the Dynamic Bookstore)

**An online copy of the textbook is available with the Wiley-Plus code.*

EXPECTATIONS

This is a fast pace course. For a successful completion of this course, you are not only expected to come to the class regularly, but also take notes in the class regularly, solve the problems assigned in the class, and read the example problems from the text book. **In order to keep up with the pace of the course, I strongly suggest you to read the sections in the text indicated in the schedule before you get to class**.

UNIVERSITY GENERAL EDUCATION GOALS

Course PHY 130 is an approved course in the WCU General Education program. It is designed to help students meet the following general education goals:

Gen Ed Goal 2: Employ quantitative concepts and mathematical methods

- Students will apply quantitative and mathematical methods to solve problems from introductory mechanics and thermodynamics.

Virtually every topic discussed in the class will have a quantitative aspect that will require algebraic reasoning. These methods will be employed during class examples, midterm exams, and laboratory sessions.

Gen Ed Goal 3: Think critically and analytically

- Students will analyze physical situations and identify what aspects are fundamental to physical modeling.

Mechanics and thermodynamics, the primary subject matter of this course, involve the complex interplay of such concepts as force, momentum, and potential energy. Critical and analytical thinking are essential for applying these concepts to efficiently solve homework and exam problems. One of the many examples might be making assumptions and inferences necessary to analyze the collision of a projectile with a hanging block.

ADDITIONAL LEARNING OUTCOMES

Our goals are to explore, analyze, and investigate the world around us to gain a better understanding of how and why various physical phenomena occur. In this course, we aim to develop a fundamental understanding of principles of kinematics, work, energy, rotational dynamics, collisions, thermodynamics, and fluids. We will also aim to apply these concepts in solving problems to gain both qualitative perspective and quantitative understanding of various physical phenomena.

GRADING

The final grade assessment for this course will be based on the following:

- Lab..……15%
- Homework ……..20%
- Exams (3 @ 15% each)……45%
- Final exam…..……20%

Letter grades will be assigned on the following scale. However, I reserve the right to adjust the weights of individual components, or the scale to account for unforeseen circumstances.

93 – 100 %	A	73 – 76 %	C
90 – 92 %	A–	70 – 72 %	C–
87 – 89 %	B+	67 – 69 %	D+
83 – 86 %	B	63 – 66 %	D
80 – 82 %	B–	60 – 62%	D–
77 – 79 %	C+	59% or lower	F

LABORATORY

This course has a laboratory component. Your lab grade will be factored into your final grade for this course. Please see the lab syllabus for more details.

HOMEWORK

This course will utilize an online homework system via Wiley-Plus. Homework will be assigned every week, starting from the first week of classes. Typically, the assignments are due by **11:00 PM (EST) on the due date**. Solutions to all homework problems will be available on Wiley-Plus immediately after the assignment is due. So, no late submissions are allowed. I reserve the right to modify homework frequency and due-dates to reflect unforeseen circumstances. **I will not drop any homework grades.**

Please remember that you are responsible for completing homework assignments in a timely manner and informing me of problems, if any, in accessing the homework. Failure to complete an assignment because you could not access the homework an hour before it is due is not an excuse.

It cannot be overemphasized the importance of spending time on these assignments. ***The assigned homework is the minimum amount of practice a highly gifted student would need. I highly suggest doing more, as many as possible, practice problems. Please note the textbook has answers for all of the odd problems.***

EXAMS

Four in-class exams (closed book) will be given during the course of the semester. Each of these exams will consist of a combination of multiple choice questions (conceptual and numerical) and open-ended numerical problems for which the students are expected to show all the work (math steps). **I will drop the lowest exam grade.**

If you miss an exam: If you miss an exam, you will receive a ZERO on that exam. The policy of dropping an exam score is meant to alleviate the need for make-up exam. This means every student has one in-class exam that they can for whatever reason, sickness, family emergency, etc., not be counted. **Therefore, I will not give a make-up exam**. The exceptions, however, are limited to the absences related to University Sanctioned Events (see below). If you miss an exam for a University Sanctioned Event you must notify me in advance so that we can arrange for you to take the exam in a manner consistent with its integrity. You must also provide some form of documentation (performing arts program, competition schedule etc.

FINAL EXAM

The final exam (closed book) will include all topics covered (cumulative) in the course and is mandatory. Final exam will consist of mostly multiple choice questions (conceptual and numerical) and few open-ended questions. Missing the final exam will result in a zero for the exam unless EXTREME circumstances apply. Even in that case, extra questions will be added to the make-up final. You must bring your university ID to the final exam.

The date and time of the final exam for this course (as set by the registrar) is: **Wednesday, December 10, 2014 from 1:00 pm – 3:00 pm**. ***You should plan to be available for the entire finals week.*** We have in past semesters had to reschedule finals due to weather related events. The final exam will be held in Merion 109.

D2L

This course has a D2L page. I will post lecture slides, important conceptual and numerical multiple choice questions etc. to D2L. I will make a good faith effort to post draft versions prior to the lecture, *but these may have few revisions*. Check it regularly.

E-MAIL POLICY STATEMENT

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.

ATTENDANCE POLICY

A regular attendance to the lectures is an important part of this course and I highly recommend it. This is your chance to ask questions, see examples and get help in solving problems. I am here to guide you through the material. Attendance will benefit your understanding and therefore grade. However, I do not give an attendance grade. Students must understand that they are responsible for all material covered and assigned during their absences (excused and unexcused) and that they are responsible for the academic consequences of their absences. The lab component of this course, however, has a different attendance policy. **Please see lab syllabus for lab attendance policy**.

PHYSICS TUTORING

The Learning Assistance & Resource Center (LARC), (610) 436-2535, offers physics tutoring. **I also strongly encourage you to utilize my office hours.**

DISABILITY STATEMENT

If you have a disability that requires special accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodation and meet with me as soon as possible so that I can support your success in an informed manner. Also, contact the Office of Services for Students with Disabilities (OSSD) at (610) 436-2564, their email address is ossd@wcupa.edu, and their website is www.wcupa.edu/ussss/ossd. Sufficient notice is needed in order to make the accommodations possible. Both the WCU and I desire to comply with the ADA of 1990.

ELECTRONIC DEVICES POLICY

In order to create a conductive learning environment, please arrange for all electronic devices to be set in silent/vibrate mode and put away. If you need to use a device to accommodate a disability, please see below. If I see anyone **texting or using their cell phones** during the class, I will take 5 points off of the nearest exam grade, and you will be considered "absent" for that day, since you are obviously not mentally present.

COURSE SCHEDULE: A tentative schedule for the course is given in the next page. I will try to follow it as closely as possible. I reserve the right to modify the schedule as needed over the course of the semester. Please note that if the University is closed (due to snow or for any other reason) for a regularly scheduled lab session, then we will use one of the weeks marked as "No Laboratory" to makeup the canceled lab sections.

Physics 130 (General Physics I)

Date		Lecture	Reading	Laboratory
M	Aug. 25	Introduction, Units, and Trigonometry	1.2, 1.4	Introduction
W	Aug. 27	Scalars & Vectors; Vector Addition	1.5, 1.6	
F	Aug. 29	Vector Subtraction; Components of a Vector	1.6 – 1.8	
M	Sept. 1	**No Class – Labor Day**		Measurement
W	Sept. 3	Motion in 1-D: Displacement, Speed & Velocity	2.1 – 2.3	
F	Sept. 5	Motion in 1-D: Acceleration, Equations of Kinematics	2.3 – 2.5	
M	Sept. 8	Equations of Kinematics & Free Fall	2.5 – 2. 6	Kinematics
W	Sept. 10	Graphical Analysis and Lots of Problems	2.7	
F	Sept. 12	Kinematics in 2-Dimensions	3.1, 3.2	
M	Sept. 15	Motion in 2-D: Projectile Motion	3.3	Free Fall
W	Sept. 17	Force and Mass, Newton's Laws of Motion (I & II)	4.1 – 4.4	
F	Sept. 19	Newton's III Law, Gravitational Force	4.5 – 4.7	
M	Sept. 22	The Normal Force, Static Friction	4.8 – 4.9	Projectile Motion
W	Sept. 24	**EXAM 1: Chapters 1 – 3**		
F	Sept. 26	Kinetic Friction, Tension Force, and Equilibrium	4.9 – 4.10	
M	Sept. 29	Equilibrium Applications of Newton's Laws	4.11	Comparison
W	Oct. 1	Non-equilibrium and Lots of Problems	4.12	
F	Oct. 3	Uniform Circular Motion: Part I	5.1 – 5.3	
M	Oct. 6	**FALL BREAK**		**NO LAB**
W	Oct. 8	Uniform Circular Motion: Banked Curves & Satellites	5.4 – 5.6	
F	Oct. 10	Work and Kinetic Energy	6.1 – 6.2	
M	Oct. 13	Gravitational Potential Energy and Conservation	6.3 – 6.5	Mechanical Energy
W	Oct. 15	Non-Conservative Forces and Power	6.6 – 6.7	
F	Oct. 17	Impulse and Momentum	7.1 – 7.2	
M	Oct. 20	**EXAM 2: Chapters 4 – 6**		Collisions
W	Oct. 22	Collisions in 1 – Dimension & Center of Mass	7.3, 7.5	
F	Oct. 24	Rotational Motion and Angular Displacement	8.1 – 8.3	
M	Oct. 27	Centripetal and Tangential Acceleration	8.4 – 8.6	Collisions-II
W	Oct. 29	Torque and Equilibrium	9.1 – 9.2	
F	Oct. 31	Center of Gravity and Newton's III law for rotation	9.3 – 9.4	
M	Nov. 3	Rotational Kinetic Energy and Angular Momentum	9.5 – 9.6	Biomechanics
W	Nov. 5	Elasticity, Energy Stored in a Spring	10.1,10.3, 10.7	
F	Nov. 7	Simple Harmonic Motion	10.2 – 10.6	
M	Nov. 10	**EXAM 3: Chapters 7 – 9**		Elasticity
W	Nov. 12	Fluids: Pressure and Pascal's Principle	11.1 – 11.5	
F	Nov. 14	Fluids: Archimedes' Principle and Continuity	11.6 – 11.8	
M	Nov. 17	Fluids: Bernoulli's Principle and Viscosity	11.9 – 11.11	Archimedes' Principle
W	Nov. 19	Waves and Sound: Waves on a String	16.1 – 16.3	
F	Nov. 21	Sound: Speed of Sound, Intensity, and the Doppler Effect	16.5 – 16.9	
M	Nov. 24	Superposition, Standing Waves and Resonance	17.1, 17.5, 17.6	**NO LAB**
W	Nov. 26	**THANKSGIVING BREAK**		
F	Nov. 28			
M	Dec. 1	Temperature and Heat	12.1 – 12.2, 12.4 – 12.7	Turn in Lab Report
W	Dec. 3	**EXAM 4: Chapters 10 – 11 & 16**		
F	Dec. 5	Kinetic Theory	14.1 – 14.3	
M	Dec. 8	The laws of Thermodynamics	15.1 – 15.3, 15.7 – 15.9	**NO LAB**

ACADEMIC INTEGRITY & CONDUCT

I have a zero tolerance policy for breaches of academic integrity. Breaches of academic integrity will be investigated and sanctions imposed to the full extent available under University policy. For questions regarding the university Academic Dishonesty, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to their major department's handbook, the Undergraduate Course Catalogue, the Rams Eye View, or the University Web Site. Please understand that improper conduct in any of these areas will not be tolerated and may result in immediate ejection from the class.

UNIVERSITY SANCTIONED EVENTS

If you are participating in a University sanctioned event during one of our scheduled exams you must notify me in advance. You must provide some form of documentation. We can then arrange for you to take the exam in a manner consistent with exam integrity. For details please see the discussion of University Sanctioned Events in the WCU undergraduate catalog.

ALL OTHER ACADEMIC POLICIES

For any university wide academic policy not explicitly covered in this document, such NO Grade policies, please consult your major advising handbook, the Undergraduate Catalog, the Ram's Eye View, or University Website.

PUBLIC SAFETY

The Emergency Communications Committee recommends that the number of WCU's Department of public safety be available on every course syllabi. WCU Department of Public Safety: **(610) 436-3311**.

INTELLECTUAL PROPERTY STATEMENT

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