## **COURSE AND INSTRUCTOR INFORMATION**

**Course:** Physics 130 – 3 (General Physics I) **Lecture Location:** Merion 112 **Lecture Time:** M, W, F: 2:00 pm – 2:50 pm

Instructor: Anil K. Kandalam (Dr. Kandalam or Dr. K)
Office Location: Schmucker Science South, SSS 403A
Email: akandalam@wcupa.edu
Office Hours: M, W, F: 10:00 am – 11:00 am Thursday: 1 pm – 3 pm

#### **COURSE DESCRIPTION**

PHY130 is an introductory physics course, that covers 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.

High school **algebra** and **trigonometry** are the prerequisites for this course. Both of them are used early and often (almost on a daily basis) in this course. If you know/think that your mathematical skills are weak, please feel free to come and see me during office hours or by appointment. I am willing to work with you and help you catch up.

## **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.

In addition, you are expected to get the solutions from the instructor for the problems that you could not solve correctly on the homework and the exams.

#### **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 handouts (will be posted on D2L)

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

#### SPECIFIC COURSE OBJECTIVES

Students completing this course will be able to

- Develop a fundamental understanding of principles of kinematics, work, energy, rotational dynamics, collisions, thermodynamics, and fluids
- Apply these concepts in solving problems
- Exercise and develop reasoning skills
- Develop problem solving skills

## UNIVERSITY GENERAL EDUCATION GOALS

This course strives to have students meet the following general education goals:

- 1. Ability to communicate effectively
- 2. Ability to employ quantitative concepts and mathematical methods
- 3. Ability to think critically and analytically

#### CONTACT POLICY

Please include *PHY130 and our meeting time* in the subject line of any e-mail. I try to respond to e-mail within 24hrs. Although I will try to answer all questions directed to me by e-mail, most problems related to course content are best discussed in office hours.

#### ASSESSMENT

Student learning will be assessed through weekly homework assignments, three examinations, laboratory, and the final exam.

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

- In-class Exams ......40%
- Final exam......20%

Letter grades will be assigned on the following scale:

93 – 100 %	Α	73 – 76 %	С
90 - 92 %	A–	70 – 72 %	C-
87 – 89 %	B+	67 – 69 %	D+
83 - 85 %	В	64 - 66 %	D
80 - 82 %	B-	60 - 62%	D-
77 – 79 %	C+	59% or lower	F

I do not norm-reference (or scale) the grades.

#### LABS

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 POLICIES**

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 8:00 PM (EST) on Sunday. Homework submissions after the due date will receive a 60% reduction in point value. Online homework systems have several advantages including, multiple attempts, tutorial services, and the ability to turn in assignments remotely. I reserve the right to modify homework frequency and duedates 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. You are strongly encouraged to complete the homework well in advance of the due date.

#### **IN-CLASS EXAM POLICY**

Three 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 numerical problems for which the students are expected to show all the work (math steps). I will drop your lowest exam score.

In the case of an absence on the day of an exam, the student 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).

#### FINAL EXAM POLICY

The final exam (closed book) will include all topics covered (cumulative) in the course and is mandatory. Final exam will consist of multiple choice questions (conceptual and numerical) only. 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.

#### 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**.

#### **DISABILITY STATEMENT**

If you have a disability which will require special accommodation, please meet with me as soon as possible to discuss your needs. Also, contact the Office of Students with Disabilities at (610) 436-2564. 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 above.

#### **D2L**

This course has a D2L web page. Laboratory assignments, announcements, and supplementary materials will be posted here. Please check D2L periodically.

#### 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.

#### PHYSICS TUTORING

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

#### **INTELLECTUAL PROPERTY STATEMENT**

The instructor utilizes copyrighted materials under the "Freedom and Innovation Revitalizing United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyright protected materials, all other intellectual property associated with this course is owned and copyrighted by the instructor, including, but not limited to, lectures, course discussions, course notes and supplementary materials posted or provided or provided to students authored by the instructor, assessment instruments such as exams, and presentation slides. No recording, copying, storage in a retrieval system, or dissemination in any form by any means of the intellectual property of the instructor, in whole or in part, is permitted without prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of the finals in the semester in which this course is held.

Links and references to on-line resources provided by the instructor may lead to other sites. The instructor does not sponsor, endorse or otherwise approve of any information appearing in those sites, nor is responsible in any way for the content of those sites. The instructor makes no warranty or responsibility for the copyright status of such material. However, should problems with copyright status be brought to the attention of the instructor, reference to offending materials will be removed.

#### 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.

## **SCHEDULE**

This schedule is tentative. I will try to follow this as closely as possible.

	Date	Lecture	Chapter	Laboratory		
М	Aug. 27	Introduction, Units, and Unit Conversion	1			
W	Aug. 29	Scalars, Vectors, and Vector Addition	1	Lab Introduction		
F	Aug. 31	Vector Addition (Problems), Kinematics in 1-D	1, 2			
Μ	Sept. 03	UNIVERSITY CLOSED – Labor Day				
W	Sept. 05	Kinematics in 1-D: Speed, Velocity, and Acceleration	2	No Lab		
F	Sept. 07	Kinematics in 1-D: Equations of Kinematics	2			
Μ	Sept. 10	Free Fall, Kinematics in 2 – D	2, 3			
W	Sept. 12	Kin. in 2 – D: Projectile Motion, Relative Velocity	3	Error Analysis		
F	Sept. 14	Mass, Force, and Newton's Laws of Motion	4			
Μ	Sept. 17	Forces and Applications of Newton's Laws	4			
W	Sept. 19	Applications of Newton's Laws (Problems), Review	4	Using Data Studio		
F	Sept. 21	EXAM 1: Chapters 1 – 4				
Μ	Sept. 24	Uniform Circular Motion, Centripetal Acceleration	5			
W	Sept. 26	Banked Curves, Vertical Circular Motion	5	Free Fall & Acceleration		
F	Sept. 28	Work, Energy, Work-Energy Theorem, GPE	6			
Μ	Oct. 01	Conservation of Mechanical Energy, Power	6			
W	Oct. 03	Linear Momentum, Collisions in 1 – D & 2 – D	7	Inclined Plane		
F	Oct. 05	Center of Mass, Rotational Motion, & Kinematics	7, 8			
Μ	Oct. 08	Fall Break – No Class				
W	Oct. 10	More Rotational Kinematics	8	Work and Energy		
F	Oct. 12	Torques on Rigid bodies, Rotational Work & Energy	9			
Μ	Oct. 15	Angular Momentum, Problem Solving	9			
W	Oct. 17	Review		Conservation of Momentum		
F	Oct. 19	EXAM 2: Chapters 5 – 9				
Μ	Oct. 22	Simple Harmonic Motion, the Pendulum	10			
W	Oct. 24	Harmonic Motion with Damping and Driving	10	Pendulum		
F	Oct. 26	Hooke's Law, and Fluids	10, 11			
Μ	Oct. 29	Pascal's and Archimedes' Principle, Fluids in Motion	11			
W	Oct. 31	Viscosity, Temperature, The Kelvin Scale	11, 12	Torque		
F	Nov. 02	Thermometers, Thermal Expansion	12			
Μ	Nov. 05	Heat, Internal Energy, Specific Heat, Phase Change	12			
W	Nov. 07	Heat Transfer Mechanisms and Applications	13	Biomechanics		
F	Nov. 09	Ideal Gas Law, Kinetic Theory of Gases	14			
Μ	Nov. 12	The $0^{\text{m}}$ and $1^{\text{st}}$ Laws of Thermodynamics	15			
W	Nov. 14	Specific Heat Capacities, 2 <sup>nd</sup> law of thermodynamics	15	Archimedes' Principle		
F	Nov. 16	Review				
M	Nov. 19	EXAM 3: Chapters 10 – 14				
W	Nov. 21	THANKSGIVING BREAK		NO LABORATORY		
F	Nov. 23	THANKSGIVING BREAK				
Μ	Nov. 26	Heat Engines, Carnot's Principle, and Refrigerators	15	<b>.</b>		
W	Nov. 28	Entropy and 3 <sup>th</sup> Law of Thermodynamics	15	Spring-Mass Oscillator		
F	Nov. 30	Waves, Sound as a wave	16			
Μ	Dec. 03	Doppler Effect, Superposition of Waves	17			
W	Dec. 05	Interference and Standing Waves	17	Standing Waves		
F	Dec. 07	Review for Final				
M	Dec. 10	Review for Final		NO LABORATORY		
	Final Examination: December 12, 2012 (3:30 pm – 5:30 pm)					