Physics 130-01 and 130-02
Fall 2013
Dr. Pfeil

Course Meeting Time and Place

Meeting Time: MoWeFri 12:00-12:55 pm (130-01)
MoWeFri 1:00-1:55 pm (130-02)
Meeting Place: Merion 112

Contact Information:

- email: spfeil@wcupa.edu (please include lecture section e.g. PHY130-01 or PHY130-02 in the subject line.)
- office: Schmucker Science South 229 (please note this is not in Merion)
- phone: (610) 430-4084

Course Description:

Physics 130 is the first semester of an algebra based survey of Physics. Topics covered include kinematics, dynamics, thermodynamics, and kinetic theory. In a nutshell, this semester we will learn how forces give rise to motion, and the consequences of that motion both at a macroscopic and microscopic scale.

PHY130 is primarily a service course for biological and health science fields. We will emphasize biological applications of physics in this course. The content of Physics 130 and 140 set the ground rules which all biological systems obey.

A laboratory portion of this course will provide hands-on experience with these phenomena, and give a glimpse into how scientists discovered the physical laws covered in the lecture.

A good grasp on high-school algebra and trigonometry is a pre-requisite for this class. Mathematical language provides the precision required to state physical laws and the tools to manipulate them. We will be using algebra and trigonometry on a daily basis. ***If you feel you have any deficiencies in your mathematical preparation, please see me.***

Specific Learning Outcomes:

Our goals are:

- An ability to think critically and analytically.
- An ability to use words, equations, and graphs to communicate effectively in a technical setting.
- An ability to apply reductionist problem solving techniques.
- An ability to employ quantitative concepts and mathematical models.
- Mastery of course material.

Required Course Materials:

- *Physics* by Cutnell and Johnson, 9th ed. Wiley.
- WileyPlus access code for *Physics* 9th ed.
- Physics 130 lab manual handouts (provided on D2L).
- Laboratory Notebook

Office Hours:

My scheduled office hours as of the first day of class are listed below. I reserve the right to adjust this schedule to reflect unforeseen circumstances.

Monday	Wednesday	Thursday	Friday
9-10 am	9-10 am	8-9 am	9-10 am 2-3 pm

Time Commitment and Work Flow

The life of a college student is not easy. A full time student can expect to spend about 50 hrs per week on coursework, or about 12.5 hrs per week per course. Here is how I recommend you spend your 12.5 hours for Physics 130.

Activity	Time Commitment
Reading Prior to Class	1.5 hrs/week
Class	2.5 hrs/week
Post Lecture Study	1.5 hrs/week
Homework After Lecture	3.75 hrs/week
Reading Prior to Lab	0.25 hrs/ week
In Lab Time	2 hrs/week
Post Lab Write-Up	1 hrs/week
Total Time Spent	12.5 hrs/week

Course Schedule:

Below is a tentative schedule for the course. Although I will endeavor to stick closely to the schedule as posted below, I reserve the right to modify it as needed over the course of the semester.

Date		#	Topic	Reading	Graded Homework	Practice Problems	Lab
08/26/13	M	1	Introduction and what to expect.	1.1-1.4 (not required)	None	WileyPlus Tutorial	
08/28/13	W	2	Modeling motion in 1D: Displacement, speed versus velocity, and acceleration.	2.1-2.3	CH2: 4, 9, 18	CH2: 6, 7, 8	
08/30/13	F	3	Modeling Motion in 1D: Constant acceleration kinematics.	2.4-2.5	CH2: 24, 28, 29	CH2: 25, 27, 31	No Lab
09/02/13	M		**No Class- Labor Day**				
09/04/13	W	4	1D Kinematics: Free Fall and Graphical Approaches	2.6-2.7	CH2: 45, 48, 67	CH2: 44, 65, 68	Introduction to measurement
09/06/13	F	5	Vectors Part I: Theory and Examples	1.5-1.9	CH1: 23, 26, 39	CH1: 24,25, 27,28, 32, 38	

09/09/13	M	6	Vectors Part II: Lots of Examples	1.5-1.9	CH1: 40, 41, 46	CH1: 49, 51	1D Kinematics (Using Data Studio)
09/11/13	W	7	Modeling motion in 2D	3.1-3.3	CH3: 2, 5, 12, 15, 41	CH3: 3, 17, 23, 24, 43	
09/13/13	F		**Exam 1**				

09/16/13	M	8	A model of what causes acceleration: Newton's 1st and 2nd Laws	4.1-4.3	CH4: 1, 2, 4, 5	CH4: 6, 7, 8	
09/18/13	W	9	When I push you, you push me: Newton's 3rd Law	4.4-4.5	CH4: 7, 12, 14, 15, 16	CH4: 11, 13, 95	
09/20/13	F	10	Force Laws I: Gravity and Normal Force	4.6-4.8	CH4: 22, 28, 38, 40	CH4: 23, 25, 42	Free Fall

09/23/13	M	11	Force Laws II: Friction and Tension	4.9-4.10	CH4: 43, 45, 56		
09/25/13	W	12	When the acceleration is zero: Equilibrium Applications of Newton's Laws	4.11	CH4: 54, 57, 58	CH4: 46, 52, 53	
09/27/13	F	13	When the acceleration is not zero: Non-Equilibrium Applications of Newton's Laws	4.12	CH4: 72, 73, 74	CH4: 70, 71, 76	No Lab

09/30/13	M	14	When the acceleration is perpendicular to the velocity 1: Uniform Circular Motion 1	5.1-5.4	CH5: 1, 7, 8, 11	CH5: 5, 9, 12	
10/02/13	W	15	When the acceleration is perpendicular to the velocity 2: Uniform Circular Motion 2	5.5-5.6	CH5: 14, 16, 17	CH5: 15, 26	
10/04/13	F		**EXAM 2**				Projectile Motion

10/07/13	M		**Fall Break**		None	None	
10/09/13	W	16	A Scalar Description of Motion: Work and Kinetic Energy	6.1-6.2	CH6: 2, 3, 4, 13	CH6: 8, 10, 19	
10/11/13	F	17	Gravitational Potential Energy and Conservation	6.3-6.5	CH6: 29, 30, 36, 52	CH6: 31, 47	Coefficient of Friction

10/14/13	M	18	Non-Conservative Forces and Power	6.6-6.7	CH6: 63, 64	CH6: 62, 65	
10/16/13	W	19	Impulse and Momentum 1	7.1-7.2	CH7: 2, 8, 16	CH7: 1, 5, 19	
10/18/13	F	20	Impulse and Momentum 2: Modeling Collisions	7.3-7.6	CH7: 28, 32, 33	CH7: 30, 55, 56, 58	Comparing Measured Values

10/21/13	M	21	1D Motion on a circle: Rotational Kinematics	8.1-8.3	CH8: 3, 9, 22	CH8: 10, 20, 23	The Work Energy Theorem and GPE.
10/23/13	W	22	Rolling motion and centripetal acceleration.	8.4-8.6	CH8: 35, 40, 54	CH8: 48, 55, 562	
10/25/13	F	23	Torques and Equilibrium	9.1-9.2	CH9: 2,3,4	CH9: 5,7	

10/28/13	M	24	Center of Gravity and Newton's 2nd Law For Rotation.	9.3-9.4	CH9: 12, 15, 22	CH9: 18, 19	Air-Cart Collisions
10/30/13	W	25	Rotational Kinetic Energy and Angular Momentum	9.5-9.6	CH9: 34, 52, 59, 61	CH9: 35, 48, 60	
11/01/13	F		**EXAM 3**		None	None	

11/04/13	M	26	Hooke's Law and Young's modulus, Elastic Energy	10.1, 10.3, 10.7	CH10: 2, 6, 54, 30	CH10: 1, 5, 51, 52, 32	The Application of Torques to Biomechanics.
11/06/13	W	27	Inertia and a simple restoring force: Simple Harmonic Motion	10.2-10.6	CH10: 15, 16, 17	CH10: 74, 75	
11/08/13	F	28	Fluids Pressure, Pascal's Principle	11.1-11.5	CH11: 2, 15, 24, 34	CH11: 4, 14, 25, 36	

11/11/13	M	29	Archimedes' Principles	11.6	CH11: 40, 41, 43	CH11: 42, 45, 46	Hooke's Law and Elasticity
11/13/13	W	30	Modeling Fluid Flow Take 1: Continuity and Bernoulli's Equation	11.7-11.9	CH11: 55, 56, 61	CH11: 54, 57, 65	
11/15/13	F	31	Modeling Fluid Flow Take 2: Applications of Bernoulli's Equation and Viscosity	11.10-11.11	CH11: 67, 78, 80	CH11: 81, 82	

11/18/13	M	32	Energy Transport: Waves on a String	16.1-16.3	CH16: 3, 4, 13	CH16: 1, 2, 12, 14	Archimedes' Principal
11/20/13	W	33	Energy Transport Sound: Sound	16.5, 16.7	CH16: 39, 52, 56	CH16: 53, 57	
11/22/13	F	34	More than one wave at once: Wave Interference and Beats	17.1-17.2,17.4	CH17: 2, 20, 21	CH17: 3, 19, 22	

11/25/13	M	35	Standing Waves and Resonance	17.5-17.6	CH17: 27, 28, 30	CH17: 29, 31	No Lab
			Thanksgiving Break				

12/02/13	M		**EXAM 4**		None	None	
12/04/13	W	36	Temperature and Heat	12.1-12.2, 12.4-12.7	CH12: 11, 47	CH12: 10, 49	
12/06/13	F	37	Kinetic Theory	14.1-14.3	CH14: 13, 35, 37	CH14: 15, 36, 38	No Lab

12/09/13	M	38	The laws of Thermodynamics	15.1-15.3 and 15.7-15.9	CH15: 1, 3, 6	None	
TBA			**Cumulative Final**				No Lab

Assessment:

I will be using the D2L grade-book feature to post course grades. Please check it periodically.

- **Laboratory** (15%): Laboratory notebooks will be checked for completeness. A brief lab write-up associated with each lab will be graded in depth.
- **Homework** (15%):
  - Homework assignments are due once a week on WileyPlus at 11 pm Sunday night.
  - For administrative reasons each weekly homework assignment of 9-15 problems has been broken up into three mini-assignments, one for each lecture.
  - I strongly suggest attempting each mini assignment as the material is covered, rather than waiting until the weekend.
  - Solutions to all homework are available online after the due date.
  - Because solutions will be available no late homework will be accepted.
  - **In addition to graded assignments, additional practice problems will be made available on WileyPlus**

- **Regular Exams** (45%, best 3 of 4 @ 15% per exam.): Four regular exams will be given during the semester. I will keep your highest three scores.
    - **If you miss a regular exam :** 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.) In all other cases a missed exam will be treated as your dropped exam.
    - **If you have an OSD letter pertaining to exams:** You are responsible for making the appropriate arrangements **prior** to the exam date and time.
- **Final Exam** (25%): The final is cumulative and will require synthesis of concepts from different parts of the course.

I will be using the official WCU scale for grades, see p.48 in the undergraduate catalog. However, I reserve the right to adjust the weights of individual components, or the scale to account for unforeseen circumstances.

In terms of the WCU standard and the courses point system grades are as follows.

Letter	Grade Points	Percentage	
A	4.000	93 - 100	Excellent
A-	3.670	90 - 92	
B+	3.330	87 - 89	Superior
B	3.000	83 - 86	
B-	2.670	80 - 82	
C+	2.330	77 - 79	Average
C	2.000	73 - 76	
C-	1.670	70 - 72	
D+	1.330	67 - 69	Below Average
D	1.000	63 - 66	
D-	0.670	60 - 62	
F	0.000	59 or lower	Failure

Electronic Device Policy:

The pace of the course is such that your undivided attention will be required for the entire lecture and lab period. Please set all electronics to silent or "vibrate mode" and put them away. Both you and your neighbors will be able to concentrate on the material at hand.

D2L/WileyPlus:

We will be using two online platforms for this course WileyPlus, the publisher's homework system, and D2L. Homework assignments are to be performed on WileyPlus. To allow for *structured note taking* I will

post my lecture slides prior to class. These slides intentionally leave some information, such as example solutions out, and provide space to fill that material in during lecture.

Attendance Policy:

It is a bad idea to miss lecture. Lecture attendance for PHY130 is strongly correlated with performance on homework assignments and exams. We will do a number of examples in lecture.

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 (OSD) at (610) 436-2564. Both WCU and I desire to comply with the ADA of 1990.

University Sanctioned Events:

If you will be participating in a University sanctioned event during class or an exam **you must notify me in advance.** Please see the discussion of University Sanctioned Events in the general catalog.

Physics Tutoring:

Physics tutoring is available through LARC (610) 436-2535. In the past peer tutoring has also been available from SPS (the Society of Physics Students). If SPS tutoring becomes available this semester I will make an announcement. **These should be considered in addition to my office hours, which are the first place you should stop for additional help.**

Intellectual Property Statement:

I, the instructor, utilize copyrighted materials under the "Freedom and Innovation Revitalizing the United States Entrepreneurship Act of 2007" (Fair Use Act). Apart from such copyrighted 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, slides, assessment instruments such as exams, and supplementary materials posted or provided to students authored by the instructor. 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 finals of the semester in which this course is held.

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.

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.