Physics 216: Optics, Thermodynamics, and Relativity
Spring 2017

Instructor:	Paul Voytas
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My Webpage:	http://userpages.wittenberg.edu/pvoytas/index.html
Class Web site:	http://userpages.wittenberg.edu/pvoytas/courses/p216_s17/p216_s17.html, where homework and reading assignments and other material for the course will be available.
Office Hours:	**TBD**
Text:	**Physics for Scientists and Engineers: A Strategic Approach, 4/e** by Randall Knight
Online system:	Mastering Physics (should be bundled with text in bookstore) https://www.masteringphysics.com/site/login.html
Prerequisite:	**Physics 200; Mathematics 202 is suggested as a co-requisite.**

Course description:
Introduction to wave phenomena, optics, thermodynamics, and special relativity. Among the topics included are interference and diffraction, refraction and optical systems, the thermodynamic properties of matter, and special relativity.

Readings: There will generally be assigned readings and reading questions before each class period. Doing the readings will 1) help you with homework and 2) enable me to focus class time where most needed so you will get more out of the class time.

Homework: In addition to reading questions, a problem and question set will generally be assigned each week and will be due at the beginning of class on Fridays. There will be some online HW and some written out problems. Some will be over material from previous class sessions (review questions), and some will be over the material for the upcoming class period (preparation questions). Late homework will be accepted for half credit until the beginning of the next class after the assignment was due.

Exams: There will be 3 exams and a comprehensive final.

Grading:		
	Homework:	15%
	Lab:	20%
	3 Exams @15%:	45%
	Final:	20%
	Total:	100%

Letter grades will be assigned according to the percentage of possible points you have accumulated at the end of the semester. You are guaranteed that the divisions between grades will be no higher than the following: 90%≤ A^-,A ≤ 100%, 80% ≤ B^-,B, B^+<90%, 70% ≤ C^-,C, C^+<80%, 60% ≤ D^-,D, D^+<70%, F<60%. In borderline cases, attendance, class participation, and trend in exam scores will be used to decide whether to award the higher grade.

Accommodations: Note to Students with Disabilities: Wittenberg University is committed to providing reasonable accommodations for eligible students with disabilities. If you are eligible for course accommodations due to a disability, please provide me with your self-identification letter from the Office of Academic Services (206 Recitation Hall), so that we may discuss your learning needs. Early identification at the start of the term is required to ensure timely provision of services. If you need to contact the Office of Academic Services, please contact Roberta Perry at 937-327-7891 or rperry@wittenberg.edu.

Attendance: Unless something physically prevents you from doing so, contact me *before* class or lab if you are going to be absent. Makeup labs and exams will be available only in cases of excused absences.

Specific Departmental Learning Goals
By the end of this course you will be able to (at an introductory level, in the topics covered):

- Qualitatively describe the behavior of some natural world phenomena in terms of fundamental physical laws.
- Quantitatively solve problems that describe some physical processes.
- Have some understanding as to what constitutes a physical measurement and some of the techniques by which physical measurements are made.
- Have an understanding of some aspects of the relationship between science and technology.
- Demonstrate a basic understanding of fundamental physical principles particularly in the areas of mechanics, waves, optics, thermodynamics, electricity and magnetism, and modern physics.
- Design and conduct experiments at a reasonably sophisticated level.
- Present orally and in writing the results of experiments and calculations in a logical, coherent manner, using a format that is accepted by the physics community.
- Apply a variety of mathematical techniques to the theoretical analysis of physical phenomena.
- Apply computer techniques to the acquisition, analysis and presentation of data, and to the solution of physics problems.

(over)

Tentative course schedule:

Date (week of or **specific date)**	**Topics**	**Laboratory**	**readings**
1/9	Fluids, Elasticity	HTCE, Error analysis, LoggoerPro	Ch 14
1/16	Waves	Fluids	Ch 16
1/23	Superposition	Faculty Retreat, no lab	Ch 17
1/30	Wave Optics	Waves	Ch 33
2/3	**Exam 1**		
2/7	Ray Optics	Interference and Diffractin	Ch 34
2/14	…continued	Polarization	Ch 34
2/21	Optical Instruments	Reflection/ Refraction	Ch 35
2/27	…continued	Lenses	
3/6	**Spring**	**Break**	**!!!!!!**
3/13	Macroscopic Description of Matter	Optical Instruments	Ch 18
3/17	**Exam 2**		
3/20	Work, Heat, & First Law of Thermo	Heat & Temperature	Ch 19
3/27	…continued	Heat Transfer	Ch 19
4/3	Micro/Macro Connection	Ideal Gases	Ch 20
4/10	Heat Engines and Refrigerators	Heat Engines	Ch 21
4/17	Special Relativity	Microwave Michelson	Ch 36 and supplements
4/21	**Exam 3**		
4/24	…continued…	Special Relativity	Ch 36 and supplements
5/1	…continued	TDB	Ch 36 and Supplements
5/5/2017	**Final exam**