PHY 300
Waves and Optics
Fall 2017

Meeting time and place:

Lecture:	MoWe	2:30-3:50	P-113
Lab-01:	Th	4:00-5:50	A-124
Lab-02:	Th	6:00-7:50	A-124
Lab-03:	We	4:00-5:50	A-124

Instructor:

Prof. Dominik Schneble A-106 Office hours: We 12:30-2

TA: Suko Kongtawong A-129 Office hours: Mo 1-2

TA: Brian Kaufman A-129 Office hours: Mo 11-12

Topics: Free oscillations, driven oscillations and resonance, normal modes for discrete coupled oscillators and continuous media, traveling waves; Maxwell's equations and wave equation for light, polarization, reflection and refraction, coherence and interference, diffraction, ray optics, Gaussian beams.

Textbooks: Vibrations and Waves, by A.P. French (Norton)

Modern Optics, by G.R. Fowles (Dover)

Grading: HW 20%, Midterm Exam 20%, Final Exam 30%, Laboratory work 30% (9 labs, see below)

Schedule and assignments

(subject to change, check web page http://ultracold.physics.sunysb.edu/Courses/PHY300-17.Fall/ regularly)

Wk		Lecture	Lab*	Homework*
1	Aug 28 [lecture notes] **Free oscillations**	Aug 30 [lecture notes]	no lab - read lab introduction and lab rules	HW01 [due 9/11]
2	Sep 4 [no classes]	Sep 6	no lab	
3	Sep 11 **Driven oscillations**	Sep 13	(1) Resonance	
4	Sep 18 **Coupled oscillators**	Sep 20	(2) Coupled oscillators	
5	Sep 25	Sep 27 **Continuous systems**	(3) Speed of sound	
6	Oct 2	Oct 4 **Wave properties of light**	(4) Transmission line	
7	Oct 9	Oct 11 **Polarization**	makeup lab	
8	Oct 16	Oct 18 **Midterm exam**	no lab	
9	Oct 23 **Reflection and Refraction**	Oct 25	(5) Polarization	
10	Oct 30	Nov 1 **Coherence and two-beam interference**	(6) Michelson interferometer	
11	Nov 6 **Multiple-beam interference**	Nov 8	(7) Fabry-Perot interferometer	
12	Nov 13 **Diffraction**	Nov 15	(8) Diffraction	
13	Nov 20	Nov 22 NO CLASS [THANKSGIVING	no lab	

		BREAK]		
14	Nov 27 **Ray optics**	Nov 29	(9) Optical instruments	
15	Dec 4 **Fourier optics**	Dec 6 **Gaussian beams**	makeup lab	
16	Dec 12 TUES **Final exam [5:30-8:00pm in P-118]**			

*Regulations for lab and homework

HOMEWORK: The homework will be collected **in class** on **the due dates indicated**, and it will be graded. You may work together on solving the problems, but cannot hand in the same solutions - we will be on the watch for this kind of problem. Solutions will be posted after the homework is collected. **Therefore, late papers will NOT be accepted.**

LAB RULES: You will be required to perform the experiments described in the laboratory manuals (download above). Before you begin these you must present a writeup as you enter the lab. Nobody can perform an experiment without presenting the writeup **FIRST**. Your writeup should describe the physical ideas you plan to explore, the way you will go about exploring them, and your anticipated results. It need not be more than a page or two, but it is not length-limited either. Write it into your lab notebook and have the lab TA sign it. This writeup will not be graded but the TA's approval and signature are required **BEFORE** you can start on the experiment.

After you have completed your measurements, recorded in your lab books immediately following the writeup you have prepared before, you have to analyze your results and compare with the expectations in your writeup. The full lab report must be submitted to the TA on the 7th day after the lab, before the Physics Department office closes at 4:30 PM. That is, you have not much time to complete it, so you need to be well-prepared beforehand. The lab report will be graded on a scale from 0 to 10. Your grade does **NOT** depend on whether you got agreement of your results with the expectation, but only upon how well you perform your work. The report that you submit **must be your own work.** Submission of (partially) identical or overly similar lab reports counts as cheating and results in zero points for the lab for all parties involved.

You have to complete **AT LEAST eight of the nine labs** scheduled for this semester. If you miss a lab you can make up for this on one of the two scheduled make-up dates. If you have one of the 9 labs missing at the end of the semester this will be graded as zero score. If you have more than one lab missing you will **FAIL** the course no matter how well you perform in the other parts of this course.

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last update 08/27/2017