PHY 300
Waves and Optics
Fall 2016

Meeting time and place:

Lecture:	MW	4:00-5:20	P-118
Lab-01:	Th	2:30-4:20	A-124
Lab-02:	Th	5:30-7:20	A-124
Lab-03:	Tu	2:30-4:20	A-124
Lab-04:	W	2:00-3:50	A-124

Instructor:

Prof. Dominik Schneble	A-106	Office hours: W 12:30-2
TA: Sebastian Dick	tba	Office hours: tba
TA: Yan Fanglida	tba	Office hours: tba

Topics: Free oscillations, driven oscillations and resonance, normal modes for 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/PHY300-16.Fall/ regularly)

Wk		Lecture	Lab*	Homework*
1	Aug 29 **Free oscillations**	Aug 31	no lab - read lab introduction and lab rules	
2	Sep 5 [no classes]	Sep 7 **Driven oscillations**	no lab	
3	Sep 12	Sep 14 **Normal modes**	(1) Resonance	
4	Sep 19	Sep 21 **Continuous systems**	(2) Coupled oscillators	
5	Sep 26 **Traveling waves**	Sep 28	(3) Speed of sound	
6	Oct 3 **Wave properties of light**	Oct 5	(4) Transmission line	
7	Oct 10 **Polarization**	Oct 12 **Reflection and Refraction**	makeup lab	
8	Oct 17 **Midterm exam**	Oct 19	no lab	
9	Oct 24	Oct 26 **Coherence and interference**	(5) Polarization	
10	Oct 31	Nov 2 **Multiple-beam interference**	(6) Michelson interferometer	
11	Nov 7	Nov 9 **Diffraction**	(7) Fabry-Perot interferometer	

12	Nov 14	Nov 16	(8) Diffraction	
13	Nov 21	Nov 23 NO CLASS [THANKSGIVING BREAK]	no lab	
14	Nov 28 **Ray optics**	Nov 30	(9) Optical instruments	
15	Dec 5 **Gaussian beams**	Dec 7 FINAL LECTURE	makeup lab	
16	Dec 13 TUES **Final exam** **[8:30-11:00pm 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.

ACADEMIC INTEGRITY: Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Any suspected instance of academic dishonesty will be reported to the Academic Judiciary. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu /uaa/academicjudiciary/

ELECTRONIC COMMUNICATION: Email to your University email account is an important way of communicating with you for this course. For most students the email address is 'firstname.lastname@stonybrook.edu', and the account can be accessed here: http://www.stonybrook.edu/mycloud. *It is your responsibility to read your email received at this account.* For instructions about how to verify your University email address see this: http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwardingaddress-in-the-epo . You can set up email forwarding using instructions here: http://it.stonybrook.edu/help/kb/setting-up-mailforwarding-in-google-mail . If you choose to forward your University email to another account, we are not responsible for any undeliverable messages.

RELIGIOUS OBSERVANCES: See the policy statement regarding religious holidays at http://www.stonybrook.edu/registrar/forms/RelHolPol%20081612%20cr.pdf. Students are expected to notify the course professors by email of their intention to take time out for religious observance. This should be done as soon as possible but definitely before the end of the 'add/drop' period. At that time they can discuss with the instructor(s) how they will be able to make up the work covered.

DISABILITIES: If you have a physical, psychiatric/emotional, medical or learning disability that may impact on your ability to carry out assigned course work, you should contact the staff in the Disability Support Services office [DSS], 632-6748/9. DSS will review your concerns and determine, with you, what accommodations are necessary and appropriate. All information and documentation of disability is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information go to the website http://www.sunysb.edu /ehs/fire/disabilities.shtml

CRITICAL INCIDENT MANAGEMENT: Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the University Police and the Office of University Community Standards any serious disruptive behavior that interrupts teaching, compromises the safety of the learning environment, and/or inhibits students' ability to learn. See more here: http://www.stonybrook.edu/sb/behavior.shtml

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