

PHY 300

Waves and Optics

Spring 2019

Meeting time and place:

Lecture: MWF 12:00-12:53 pm P-118
 Lab-01: Tu 8:30-10:20 am A-124
 Lab-02: We 2:30-4:20 pm A-124
 Lab-03: Tu 2:30-4:20 pm A-124
 Lab-04: We 8:30-10.20 am A-124

Instructor:

Prof. Dominik Schneble
 TA: Alfonso Lanuza
 TA: Leonid Korneev

A-106 Office hours: tba
 tba Office hours: tbd
 tba Office hours: tbd

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/PHY300-19.Spring/> regularly)

Wk		Lecture		Lab*	Homework*
1	Jan 28 Complex notation	Jan 30 Free oscillations	Feb 1	no lab - read lab introduction and lab rules	
2	Feb 4	Feb 6	Feb 8	no lab	
3	Feb 11 Driven oscillations	Feb 13	Feb 15	(1) Resonance	
4	Feb 18 Coupled oscillators	Feb 20	Feb 22	(2) Coupled oscillators	
5	Feb 25	Feb 27 Continuous systems	Mar 1	(3) Speed of sound	
6	Mar 4 Fourier transform	Mar 6	Mar 8	(4) Transmission line	
7	Mar 11 Wave properties of light	Mar 13	Mar 15 Midterm exam	makeup lab	
8	Mar 18 [Spring Recess]	Mar 20 [Spring Recess]	Mar 22 [Spring Recess]	no lab	
9	Mar 25 Polarization	Mar 27	Mar 29 Reflection and Refraction	no lab	
10	Apr 1	Apr 3	Apr 5	(5) Polarization	
11	Apr 8 Coherence and two-beam interference	Apr 10	Apr 12 Multiple-beam interference	(6) Michelson interferometer	

12	Apr 15	Apr 17 Diffraction	Apr 19	(7) Fabry-Perot interferometer	
13	Apr 22	Apr 24	Apr 26 Ray optics	(8) Diffraction	
14	Apr 29	May 1	May 3 Fourier optics	(9) Optical instruments	
15	May 6	May 8 Gaussian beams	May 10 [last day of class]	makeup lab	
16	May 13	May 15	May 17		
	May 20 Final exam [11:15-1:45]				

*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.

STUDENT ACCESSIBILITY SUPPORT CENTER: If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential. Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Student Accessibility Support Center. For procedures and information go to the following website: <http://www.stonybrook.edu/ehs/fire/disabilities>. *** **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. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html *** **CRITICAL INCIDENT STATEMENT:** Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

last update 01/23/2019