

**PHY 310 – Intermediate Physics Lab
Spring 2020**

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Office Hours: M – 8:30 am to 9:30 am
W – 8:30 am to 11:30 am
R – 2:30 pm to 3:30 pm

Phone: 610-436-3010

Office: SSS 227

Required Materials:

- An Introduction to Error Analysis, 2nd edition, Taylor.
- A laboratory notebook.
- A scientific calculator.

Course Description:

A lecture and laboratory course designed to familiarize students with modern physics laboratory equipment and practices through a series of experiments. Students write three research papers and give one research talk describing the experiments and their results in a style consistent with scientific conventions.

Course Student Learning Outcomes:

Physics 310 is an approved Writing Emphasis course in the WCU General Education program. The writing sessions, laboratory practices and data analysis sessions, draft review meetings, and presentation sessions that take place during the semester, as well as the feedback that the instructor and other faculty give you on your papers and presentations, are all designed to help you meet the following General Education goals: (1) students will be able to communicate effectively, (2) students will be able to employ quantitative concepts and mathematical methods, and (3) students will be able to think critically and analytically.

In discipline-specific terms, this course is designed to meet the following goals.

1. The student will become proficient at using a wide range of experimental tools and measurement techniques common in the modern physics research laboratory.
2. The student will become proficient at estimating and calculating uncertainties.
3. The student will become proficient at communicating the design of an experiment and the results of that experiment to an audience of physicists in writing through research-style papers and in person through research-style talks.

Experiments:

Planck's Constant (aka The Photoelectric Effect)

The Wavelength of Light from a Laser Diode

The Charge-to-Mass Ratio of the Electron

The Quantization of Atomic Energy States (The Franck-Hertz Experiment)

The Index of Refraction of Air

Attendance Policy:

Attendance is required and critical to the success of the course.

Evaluation & Grading:

The weighting for the different graded items are as follows:

Research Abstracts	40% (10% each)
Research Proposal	10%
Proposal Defense	10%
Poster	20%
Participation (online and in person)	20%
TOTAL	100%

A letter grade will be assigned based on performance in the course according to the following scale:

Grade	Quality Points	Percentage Equivalents	Interpretation
A	4.00	93-100	Excellent
A-	3.67	90-92	
B+	3.33	87-89	Superior
B	3.00	83-86	
B-	2.67	80-82	
C+	2.33	77-79	Average
C	2.00	73-76	
C-	1.67	70-72	
D+	1.33	67-69	Below Average
D	1.00	63-66	
D-	0.67	60-62	
F	0	< 60%	Failure

Refer to the Undergraduate Catalog for description of NG (No Grade), W, Z, and other grades.

Tentative Course Outline:

Week 1	1/20	Introduction Planck's Constant preparation
Week 2	1/27	Planck's Constant experiment Abstract submission
Week 3	2/3	Abstract/Notebook review Research Proposal Writing
Week 4	2/10	Submit research proposal: Group #1 (Wednesday 2/12) Group #2 (Friday 2/14) Group #3 (Monday 2/17)
Week 5	2/17	Proposal Defense - Monday (Group #1) Prep for first round of experiments and group meetings
Week 6	2/24	Round #1 of Experiments Abstract Writing
Week 7	3/2	Submit Abstract (Sunday)

		Prep for second round of experiments and group meetings
Week 8	3/9	SPRING BREAK
Week 9	3/16	Round #2 of Experiments Abstract Writing
Week 10	3/23	Submit Abstract (Sunday) Prep for third round of experiments and group meetings
Week 11	3/30	Round #3 of Experiments Abstract Writing
Week 12	4/6	Submit Abstract (Sunday) Create Poster
Week 13	4/13	Draft Poster Session (Tuesday) Revise Posters
Week 14	4/20	Poster Session #1 (45 min – Group #1) Poster Session #2 (45 min – Group #2)
Week 15	4/27	Poster Session #3 (45 min – Group #3)
Week 16	5/4	Submit Final Poster Course Reflection

Statements Common to All WCU Undergraduate Syllabi:



ACADEMIC & PERSONAL INTEGRITY

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the *Ram's Eye View*, and the University website at www.wcupa.edu.

STUDENTS WITH DISABILITIES

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. The OSSD hours of Operation are Monday – Friday, 8:30 a.m. – 4:30 p.m. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at www.wcupa.edu/ussss/ossd.

EXCUSED ABSENCES POLICY

Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Undergraduate Catalog. In particular, please note that the "responsibility for meeting academic requirements rests with the student," that this policy does not excuse students from completing required academic work, and that professors can require a "fair alternative" to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

REPORTING INCIDENTS OF SEXUAL VIOLENCE

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to meet this commitment and to comply with Title IX of the Education Amendments of 1972 and guidance from the Office for Civil Rights, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator, Ms. Lynn Klingensmith. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University protection of minors policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at the webpage for the Office of Social Equity at http://www.wcupa.edu/_admin/social.equity/.

EMERGENCY PREPAREDNESS

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

ELECTRONIC MAIL POLICY

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.