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**PHYSICS 2620: Modern Physics**
**Syllabus**

April 19, 2021

Lecture Sessions:	MWF 12:00-12:50 pm	Zoom
Instructor:	Craig Group	email: rcg6p@virginia.edu Office 113 High Energy Physics Lab
Office Hours:	4-5 Wednesday and by appointment	Zoom (TBD)
Discussion Sessions	W 2:00-2:50pm Th 3:30-4:20pm	Zoom Zoom
Teaching Assistant	???	email: ???
TA Office Hours:	TBD	TBD

Prerequisites: PHYS2415 or 1720 and MATH2310. Basic knowledge of differential equations is strongly recommended.

**Course Organization**

Students are expected to achieve an appreciation for and a quantitative understanding of the foundations of modern physics, and a working knowledge of the subject in solving practical problems. We will cover: special relativity, the photo-electric effect, quantum mechanics (Schrodinger equation), the atomic hydrogen, nuclear physics, particle physics, and cosmology.

The course comprises lecture sessions, discussion sessions (with graded quizzes), weekly homework assignments, one midterm exam, and one final exam. Each lecture session will include introduction and explanation of new concepts, and worked examples. The separate discussion session (administrated by the TA) will include Q&A session on concepts learned and previous homework problems, followed by in-class quizzes that will be graded. Quizzes will be open-book and worked in groups. The midterm and the final exams will be closed-book and pledged (TBC).

In-class polling (probably via zoom) will be used to complete in-lecture short questions and discussions. This will start counting towards the course grades in week 2.

Homework assignments will be posted on Collab every Friday and due the following Friday. Students will turn in homework via Collab. No late homework will be accepted unless a prior arrangement is made with the instructor.

**Textbook and Reading Material**

The **textbook** for the course is “Modern Physics”, by Kenneth Krane, fourth edition, published by John Wiley & Sons, Inc., ISBN-ISBN-13: 978-1119495468. Third edition is also fine ISBN-13: 978-1118061145, ISBN-10: 1118061144. Set up for Inclusive access virtually. You may also purchase a hard copy or used book.

For each chapter there will be reading materials. The readings will be listed in the course schedule. Most weeks will have a short on-line reading quiz via Collab.

### Exams

There will be one midterm exam and one final exam. Exams will be closed-book with a formula sheet provided by the instructor. The formula sheet will be provided at least one week in advance of each exam.

### Solutions and Other Printed Material

Material that will be available on Collab:

- Course syllabus, calendar, and each week's homework assignment;
- Solutions to weekly discussion quizzes;
- Solutions to homework;
- Solutions to the midterm exam;

### Grading

The final grade will be determined as follows:

- Zoom Polling (questions in lecture): 5%
- Weekly reading quizzes 5%
- Weekly discussion session quizzes: 10%
- Weekly homework assignments: 45%
- Midterm: 15%
- Final Exam: 20%

### Grade Policy:

	A	90-100 (A-: 90-92, A+: >97)
	B	80-90 (B-: 80-82, B+: 87-90)
We use an absolute grading scale:	C	70-80 (C-: 70-72, C+: 77-80)
	D	60-70 (D-: 60-62, D+: 67-70)
	F	<60

Homeworks, quizzes, and exams will be graded based on clarity, logical structure, physical insight, in addition to mathematical manipulation. Spelling, grammar, and neatness contribute to the overall assessment. Please use this opportunity to practice scientific writing. Typically, every solution should include at least:

- a diagram or figure to illustrate the problem or your solution, if applicable
- definitions of variables
- physical laws applied and relevant equations
- clear statements of any assumptions made
- algebraic answer (when appropriate): a clearly boxed answer
- numerical answers (when appropriate): a clearly circled answer with appropriate significant figures and units
- interesting conclusions or insight

### **Important Dates (TBC/updated)**

#### **Class Calendar**

The course calendar will be provided in a separate document.

#### **Honor Code**

Solutions copied from others or the internet will be considered violations of the honor code. Working with others on HW and Quizzes **in order to learn** is encouraged - blindly copying from others is grounds for being suspended from the University. While many solutions can be found online, I discourage you from looking until you have put substantial effort into figuring it out on your own. While tempting, it is never okay to just copy down a solution without understanding. It is an honor code violation, and it teaches you nothing. I trust we can all act in an honorable way. If you feel that isn't the situation for you or others, please bring it to my attention.