

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

August 28, 2018

Lecture Sessions:	MWF 12:00-12:50 pm	Rm. 204, Physics Building
Instructor:	Xiaochao Zheng	email: xz5y@virginia.edu
Instructor	W 1-2pm and 3-4pm	Office 135, Physics Building
Office Hours:	Th 1:30-3:30pm and by appointment	same
Discussion Sessions	W 2:00-2:50pm Th 3:30-4:20pm	Rm.179, Ruffner Hall Rm.G006, Ruffner Hall
Teaching Assistant	Saikat Bera	email: sb5xa@virginia.edu
TA Office Hours:	Th 4:30-7:30pm F 1-3pm	Rm.220, Physics Building same
Grader	Zack Carson	email: zack.carson@virginia.edu

Prerequisites: PHYS2415 or 2610 and MATH2310, or instructor permission. Students should have some basic knowledge of differential equations.

**Course Organization**

The student is expected to achieve a quantitative understanding of the foundations of modern physics, and a working knowledge of the subject in solving practical problems.

The course comprises lecture sessions, discussion sessions (with quizzes), weekly homework assignments, two in-class midterm exams, and one final exam. Each lecture session will include introduction and explanation of new concepts, and working examples. The separate discussion session (administrated by the TA) will include a weekly quiz of 1-2 problems, followed by discussions and explanation of the quiz problems and previous homework problems if time allows. The discussion session quizzes will not be graded. However, the midterm and the final exams may include 1-2 problems that are only slight variations of the quiz problems.

Iclickers are required to complete in-lecture short questions and discussions. Iclicker will start on Friday, August 31 and will be counted towards the final grade the following week. Iclicker grades will be posted on Collab at least monthly.

Homework assignments will be posted on Collab (under “Resources”) every Friday and due the following Friday. Students may turn in homework during the Friday lecture or to the grader’s box after the lecture, but no later than the due time shown on the assignment. No late homework will be accepted unless a prior arrangement is made with the instructor. Students are encouraged to discuss problems with others while completing homework assignments. However, it is unlikely the student will gain a passing proficiency on the course material without working out most or all of the homework problems. Thus, each student is required to work out the final solution on their own. Copying homework solutions without thinking is prohibited.

**Important:** In previous years, different textbooks were used and different sub-fields of physics were emphasized. Similarly, this time we will not be able to cover all chapters of the textbook (see next page for textbook information), and will focus on material that the instructor finds important and/or is familiar with.

### **Textbook and Reading Material**

The **textbook** for the course is “Modern Physics”, by Kenneth Krane, third edition, published by John Wiley & Sons, Inc., ISBN-13: 978-1118061145, ISBN-10: 1118061144. Both hard and electronic copies would be okay.

Note: it’s okay to use a hand-me-down textbook from previous years. To avoid confusion due to using different editions, copies of the after-chapter problems will be provided if used in the weekly homework assignment, at least for the first two weeks.

For each chapter there may be extra reading materials. These materials, as well as weekly assignments, will be posted on Collab. Some homework problems may be based on the reading material.

### **Exams**

There will be two midterm exams during class hours and one final exam. Study guides will be provided in advance, listing important concepts and equations. All exams will be close-book with a formula sheet provided by the instructor. This means you will not be able to prepare your own formula sheet. However, the formula sheet will be provided one week in advance of each exam and you may suggest additional equations or information that should be added to the formula sheet. Whether your suggestion can be accommodated will be decided by the instructor.

### **Solutions and Other Printed Material**

Material that will be available both online and as hard copies (for a limited number only):

- Course syllabus, calendar, and each week’s homework assignment;
- Practice exams along with solutions: will be provided 1-2 weeks before each exam.

Material that will be available as hard copies only, in class:

- Solutions to weekly discussion quizzes;
- Solutions to homework and the actual exams.

If you miss a lecture, remaining hard copies of the material handed out during the lecture will be placed in the hand-out box *outside* the instructor’s office door (Physics room 135) for you to pick up. Feel free to email or talk to the instructor (xz5y@virginia.edu) to request additional hard copies, if needed.

### Grading

The final grade will be determined as follows:

- Clicker questions, in lecture: 5%
- Homework assignments: 25%
- Two in-class midterm: 15% each
- Final Exam: 40%

Homeworks 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
- (for numerical answers) a clearly boxed answer with appropriate significant figures and units

Keep in mind that solutions of too short or too long lengths are both detrimental to the clarity of expressing your ideas. In other words, explain clearly, not repeatedly. You must also practice common sense when presenting your answers. If you have any question regarding how to write a good solution, feel free to ask the instructor, the TA, or the grader.

For those who fill out the course evaluation towards the end of the semester, the lowest HW score will be exempt from the final grade. Do not use this opportunity too early.

### Important Dates

- first lecture: Wednesday August 28;
- first discussion sessions: Wednesday September 5 and Thursday September 6;
- last day to add a course (College of A&S): Tuesday September 5;
- last Day to drop a course (College of A&S): Wednesday, September 6;
- **first midterm exam will be held in class on Friday, October 5;**
- no lecture on Monday October 8 (reading day);

- last Day to withdraw from a course (College of A&S): Tuesday, October 23
- second midterm exam will be held in class on Friday, November 9;
- no lecture or discussion session from Wednesday November 21 through Friday November 23 (Thanksgiving recess);
- last discussion sessions: Wednesday December 5 and Thursday December 6;
- last lecture: Friday December 7;
- final exam: Friday, December 14, 2-5pm.

### Class Calendar

The course calendar will be provided in a separate document.