University of Vermont
Department of Physics

Physics 152: Fundamentals of Physics II
Spring 2020

Instructor:  Dr. Dennis Clougherty  
Email:  dennis.clougherty+PHYS152@uvm.edu

Time:  MWF 8:30–9:20, R 8:30–9:45  
Place:  Innovation E330

Course Description:  This course is a calculus-based introduction to electricity, magnetism, and optics. It is intended for students in the natural sciences. Classes are conducted using an active-learning format. Laboratory exercises are integrated into the course.

Prerequisites:  PHYS 031 or PHYS 051, credit or concurrent enrollment in MATH 022.

Objectives:  The course is designed to acquaint the students with basic electricity, circuits, magnetism, and optics, while integrating calculus-based, problem-solving techniques in an active-learning environment.

Course Personnel:

Ms. Beth Stinebring, administrative assistant (beth.steinbring@uvm.edu).
Dr. Luke Donforth, laboratory coordinator (luke.donforth@uvm.edu)
Mr. Libin Liang, graduate teaching assistant (libin.liang@uvm.edu)
Ms. Abby Postlewaite, undergraduate learning assistant (abigail.postlewaite@uvm.edu)
Mr. Matthew Piatt, undergraduate learning assistant (matthew.piatt@uvm.edu)

Office Hours:  W R 10:00–11:00 & by appointment in Innovation E209.

References:

1. Randall D. Knight, Physics for Scientists and Engineers: A Strategic Approach, Vol. 2, 4th edition, (Pearson, 2016). (This is the required text for the course.)  
   http://go.uvm.edu/9xyj4

2. R.P. Feynman, R.B. Leighton and M. Sands, Feynman Lectures on Physics, Vol. II.  
   https://www.feynmanlectures.caltech.edu. (This recommended text is available online for free.)

3. H.M. Schey, Div, Grad, Curl, and All That: An Informal Text on Vector Calculus, 4th edition, (Norton, 2004). (This is a good text for developing intuition about vector fields.)

4. D. Kleppner and N. Ramsey, Quick Calculus, 2nd edition (Wiley, 1985). (This is an excellent review of calculus.)
Course Outline:

1. Electrostatics, including forces, fields, potentials, potential energies and capacitance
2. Electric current and circuits
3. Magnetostatics
4. Inductance - Faraday’s Law
5. Maxwell’s equations and electromagnetic waves
6. Geometric and physical optics, including reflection, refraction, polarization, mirrors, lenses, image formation, wave interference and diffraction.

Online Resources:

1. Course web site: https://bb.uvm.edu
3. Learning Catalytics: https://learningcatalytics.com
4. UVM Physics help sessions web site: https://www.uvm.edu/cas/physics/help-sessions
5. UVM tutoring center web site: https://www.uvm.edu/academicsuccess/tutoring_center
6. UVM Physics web site: http://www.uvm.edu/physics/
7. UVM student accessibility services (SAS): http://www.uvm.edu/access
8. Prof. Clougherty’s web site: http://go.uvm.edu/dpc/

Grading Policy:
Homework (10%), Reading quizzes (10%), In-class activities (35%), Exams (10% each), Final (15%).

Important Dates:

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<tr>
<th>Exam #1</th>
<th>February 12, 2020</th>
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<tr>
<td>Exam #2</td>
<td>March 4, 2020</td>
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<td>Exam #3</td>
<td>April 15, 2020</td>
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<td>Final Exam</td>
<td>May 7, 2020</td>
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Please mark these dates in your calendar now. Exams will take precedence over medical appointments, travel plans, athletic events, and other personal activities. If you miss an exam, you will receive a score of zero unless excused by Professor Clougherty prior to the exam. As a general rule, only a verifiable illness is reason to miss an exam.
**Active Learning:** In contrast to a traditional lecture course, the active-learning format requires frequent interactive student participation with the instructional staff and fellow classmates. Below are several issues pertaining to the use of active-learning methods.

1. **Attendance:** Regular attendance is essential and expected.

2. **Preparation:** Students are required to read the assigned text and complete scheduled reading quizzes on the MasteringPhysics web site before class.

3. **Homework:** Homework assignments will be completed on the MasteringPhysics web site; however, it is strongly advised that each student keep a notebook with their detailed written solutions. These solutions will help enormously in studying for the exams.

4. **Technology:** A number of class activities are completed using a web-based electronic response system. Hence, classes require a laptop or tablet with wifi and bluetooth capability. Please bring your device and its charger to each and every class.

**Accommodations:** In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of Disability Services on campus. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly encouraged to meet with their faculty to discuss the accommodations they plan to use in each course. See [http://www.uvm.edu/access](http://www.uvm.edu/access) for more information.

**Academic Integrity:** It is expected that all students will adhere to the University code of academic integrity. ([https://www.uvm.edu/sites/default/files/UVM-Policies/policies/acadintegrity.pdf](https://www.uvm.edu/sites/default/files/UVM-Policies/policies/acadintegrity.pdf))