

UNIVERSITY OF VERMONT  
DEPARTMENT OF PHYSICS

PHYSICS 152: FUNDAMENTALS OF PHYSICS II

Spring 2021

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<b>Instructor:</b> Dr. Dennis Clougherty	<b>Time:</b> MWF 8:30–9:20, R 8:30–9:45
<b>Email:</b> <a href="mailto:dennis.clougherty+PHYS152@uvm.edu">dennis.clougherty+PHYS152@uvm.edu</a>	<b>Place:</b> REMOTE MS Teams

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**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.stinebring@uvm.edu](mailto:beth.stinebring@uvm.edu)).  
Dr. Luke Donforth, laboratory coordinator ([luke.donforth@uvm.edu](mailto:luke.donforth@uvm.edu))  
Mr. Libin Liang, graduate teaching assistant ([libin.liang@uvm.edu](mailto:libin.liang@uvm.edu))  
Ms. Abby Postlewaite, undergraduate learning assistant ([abigail.postlewaite@uvm.edu](mailto:abigail.postlewaite@uvm.edu))  
Mr. Matthew Piatt, undergraduate learning assistant ([matthew.piatt@uvm.edu](mailto:matthew.piatt@uvm.edu))

**Office Hours:** M F 9:30–10:30 & by appointment on MS Teams.

**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>
2. *MasteringPhysics*: <http://masteringphysics.com>
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](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:**

Exam #1 .....	February 25, 2021
Exam #2 .....	March 25, 2021
Exam #3 .....	April 22, 2021
Final Exam .....	May, 2021 (TBD)

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. *Exams:* Exams will be based on the homework problems. You will download the exam from Blackboard at 8:30 AM on exam day. You must upload a scanned pdf of your solution to Blackboard before 9:45 AM. Exams are open-book, but you must not collaborate with anyone or use online services such as Chegg.
5. *Class recordings:* Our class sessions may be recorded for students in the class to refer back to, and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who unmute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the “chat” feature, which allows students to type questions and comments live.

**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> for more information.

**Academic Integrity:** It is expected that all students will adhere to the University code of academic integrity. Students are prohibited from publicly sharing or selling academic materials that they did not author (for example: class syllabus, outlines or class presentations authored by the professor, practice questions, text from the textbook or other copyrighted class materials, etc.); and students are prohibited from sharing assessments (for example, homework or a take-home examination). Violations will be handled under UVMs Intellectual Property policy and Code of Academic Integrity.

(<https://www.uvm.edu/sites/default/files/UVM-Policies/policies/acadintegrity.pdf>)