# QUINNIPIAC UNIVERSITY
# PHY 122 (UC) UNIVERSITY PHYSICS II
# SPRING 2020

Douglas S. Goodman, Ph.D.

## COURSE INFORMATION

Lectures: M/W/F, 3:00 - 4:50 PM

Room: Center for Communication and Engineering 022

Credit Hours: 4

Required Text: Young and Freedman, *University Physics* $14^{th}$ Edition with online *MasteringPhysics*, Pearson (2016). The text and the online *MasteringPhysics* account can be purchased together or separately. This course's unique *MasteringPhysics* Course Title and Course ID can be found on the course Blackboard page.

Office: Tator Hall 221 B

Email: Douglas.Goodman@quinnipiac.edu

Phone: (203) 582 - 6553

Office Hours: Mon. 10 - 11 am, Thur. 10:30 - 11:30 am, and Fri. 11 am - 12 pm

## COURSE DESCRIPTION

Students examine classical electromagnetism in an integrated lecture and laboratory calculus-based physics course. Topics include electrostatics, magnetostatics, dc circuits, Maxwell's equations, electromagnetic waves, and photons. Through experimentation, computer modeling, and problem solving, students apply physics principles to predict the outcome of reality-based and open-ended problems. (6 studio-lab hrs.) Prerequisite: PHY 121; minimum grade C-. Offered every year, Fall and Spring term. UC: Natural Science.

## RECOMMENDED MATERIALS

- Pen/pencil and calculator
- Students are encouraged to print lecture slides in advance and bring them to class. The slides will be made available in advance on the course Blackboard page. The lecture slides are not lecture notes, but rather a template on which notes can be taken.
- Personal laptop, but only on activity class days.

## INSTRUCTIONAL METHODOLOGIES

Students are expected to have read the relevant section(s) from the required textbook before class, as outlined in the course calendar. Student success in this course is highly dependent upon keeping up with pre-lecture reading. The class is a studio-based integrated lecture and laboratory course. Class time will primary be devoted to polling questions, practice problems that reinforce problem-solving skills, and hands-on laboratory work.

## BLACKBOARD

Syllabus, lecture notes, useful web links, grades, and other documents of interest will be posted on the lecture section's Blackboard webpage. Some assignments may require students to upload their work on to Blackboard. It is the student's responsibility to frequently monitor Blackboard and their @quinnipiac email address for any changes, updates, or announcements.

## GRADES

Final grade breakdown:

| **Item** | **Weighting** (%) |
|---|---|
| Homework | 20 |
| Activities | 15 |
| Quizzes | 50 |
| Final Exam | 15 |

The Quinnipiac University grading system:

| **Letter Grade** | **Numeric Grade** (%) |
|---|---|
| A | 93 - 100 |
| A- | 90 - 92 |
| B+ | 87 - 89 |
| B | 83 - 86 |
| B- | 80 - 82 |
| C+ | 77 - 79 |
| C | 73 - 76 |
| C- | 70 - 72 |
| D | 60 - 69 |
| F | 0 - 59 |

### HOMEWORK

*Online*

Homework assignments are due on a weekly basis and they must be submitted through the *MasteringPhysics* web based system at http://www.masteringphysics.com. Students must first purchase a registration code one of two ways – directly on the website or by purchasing a textbook that comes with a registration code. When registering, be sure to use our course's unique *MasteringPhysics* Course Title and Course ID, which can be found on the course Blackboard page.

Homework will be due weekly and is graded under the following conditions:

- Each item is worth anywhere from 0 to 5 points. Each assigned group must write up solutions to all 5-point problems. Zero-point problems are extra practice problems that do not count toward your HW grade. However, it is highly recommended that you study these problems too.
- No time limits
- Can rework problems later for study
- 5 attempts on non-multiple-choice or non-true/false questions without penalty
- Multiple choice or true/false questions will loose $\frac{100\%}{(\#\text{ of choices}-1)}$ for each incorrect attempt
- Students will *never* lose credit for using hints and may receive extra credit for correctly answering sub-questions within hints

*Paper*

Students are expected to collaborate on their homework with their assigned group. Each week, one group will be randomly selected to submit written solutions to *all* 5-point problems on that week's assignment. The written solutions will be graded and, for better or for worse, those grades will supersede the online score. ***Failure to submit written solutions will result in a zero for the entire assignment for all group members!***

## ACTIVITIES

The course is a studio-based integrated lecture and laboratory course. To that end, classes will include both lecture and hands-on activities. The activities may involve collecting and analyzing data with laboratory equipment and/or computer simulations. Students will complete write-ups after some activities, which may include data tables, plots, and answers to questions found on the activity worksheet.

## QUIZZES AND EXAMS

There will be a total of seven one-hour in-class quizzes and a cumulative two-hour final exam. All exams and quizzes are open notes and/or open text. However, students may *not* use electronic copies of their notes or text during a quiz or exam. Students may use any calculator that does not connect to the internet. Some quizzes will include both a written individual component and a hands-on group component. Quiz and exam grades will also include a peer-evaluation component.

## UNIVERSITY CURRICULUM BREADTH REFLECTION

As a UC course, all students must write a reflection piece towards the end of the semester about how their experience in the course relates to their educational objectives. A paper copy of the essay is due on the day of the final exam and an electronic copy must be uploaded to the student's ePortfolio.

## EXTRA CREDIT

1. During lectures the class will be asked multiple-choice, ranking, and Group Challenge "polling" questions. Each individual student can answer the question via hand-held "Clicker" hardware. Each student will be assigned a unique clicker ID.
    - Using a clicker identity other than your own is considered academic misconduct.
    - Each student's answer will be confidentially recorded for extra credit purposes. The statistical results of the class as a whole will be made public.
    - The multiple choice and ranking style questions are worth one "clicker point." Group challenge questions, which are longer quantitative problems solved as a group, are worth 6 clicker points. There are no penalties for wrong answers!
    - Every *three* clicker points are worth 1% of extra credit on the upcoming quiz grade. Once the quiz is completed, accumulated clicker points resets to zero and students can begin accumulating points for the next quiz. Additionally, all the points earned between the last quiz and the final exam will be applied toward the final exam score.
2. Quizzes and Exams will *not* be curved. However, each assigned group can earn a 2.5% bonus on their quiz or exam whenever their group's mean raw score is greater than or equal to 75%.

## ACADEMIC SUPPORT

- The study of the physical sciences has a long-standing tradition of collaboration. Forming a study group is the best way to help yourself and others do well in this course.
- I have an open door policy, so you are welcome to stop by my office at any time. However, if you want to guarantee my availability, then make an appointment or stop by during office hours.
- A peer fellow will be holding regular office hours that are posted on blackboard. The Peer Fellow is available to help with all assignments and quiz/exam preparation.
- The Learning Commons (LC) has a number of tutors and programs designed to give students extra help if they desire. Visit their office in the library for sign-up information.

## ATTENDANCE POLICY

Regular attendance at every class is expected. Attendance is not a direct component of your grade, but missing class will indirectly impact your performance on homework, exams, and quizzes. If you miss a laboratory activity, quiz, or exam, then you will receive a grade of zero for the write-up, quiz, or exam, respectively. Polling points can only be earned by those that attend lecture and cannot be made up outside of class.

## Late Work Policy

In general, late assignments will not be accepted and there are no make-up opportunities. Failure to submit an assignment before the due date will result in a grade of zero. However, if you contact me *in advance*, then I may be able to accommodate you. Students must always provide a letter from a healthcare provider for excuses regarding illness.

## Academic and Classroom Misconduct

### Classroom

Students are expected to treat each other, faculty, and staff with respect. Distracting or harassing behaviors will not be tolerated. Students' classroom attire, classroom behavior, laptop wallpaper, and laptop screen savers should be consistent with the goal of creating a safe and inclusive classroom environment. Students are *not* permitted to take pictures of the lecture slides or make audio/video recordings of the lectures.

### Academic

Integrity is a crucial part of the academic experience. Students must observe the University Academic Integrity Policy as found in the Quinnipiac University Student Handbook. All work that you submit in this course must be your own. No student is to give or receive assistance in the completion of any examination or quiz. Failure to do so could lead to an F in the course and even expulsion from the University. By taking the course and by attending Quinnipiac University you agree to these conditions.

## Disability Services Statement

Quinnipiac University is committed to creating a learning environment that meets the needs of its diverse student body. If you anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with me.

If you have a disability, or think you may have a disability, you may also want to meet with the Office of Student Accessibility, to begin this conversation or to request reasonable accommodations. Quinnipiac University complies with the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973.

Please contact the Office of Student Accessibility by emailing access@qu.edu, or by calling (203) 582 - 7600. If you have already been approved for accommodations through the Office of Student Accessibility, please meet with me so we can develop an implementation plan together.

# SPRING 2020 SCHEDULE

The calendar gives an outline of the specific sections from the book to be covered in each class period. Students are expected to read and study the corresponding sections from their textbook *before* coming to class. The calendar also shows the Activities, Quizzes, and HW schedule. The most up-to-date version of the syllabus will be posted on Blackboard and it may be revised periodically throughout the semester.

| Week | Monday | Wednesday | Friday | Assignments |
|---|---|---|---|---|
| 01/20 - 01/24 | No Class | Introductions<br>Survey | Ch. 1.4, 1.7 - 1.9 | HW 1 (F)<br>HW 2 (T) |
| 01/27 - 01/31 | Ch. 1.7 - 1.9<br>Vectors | Ch. 21.1 - 21.2<br>Ch. 21.4 & 21.6 | Quiz 1<br>Hard Hat | Uncertainty Wksh<br>HW 3 (T)<br>HW 4 (Th) |
| 02/03 - 02/07 | Ch. 21.4 & 21.6<br>$e/m$ Ratio 1 | Ch. 1.10 & 21.7 | Quiz 2<br>Ch. 27.2 | HW 5 (T) |
| 02/10 - 02/14 | Ch. 27.4 - 27.5<br>$e/m$ Ratio 2 | Ch. 25.1<br>Ch. 27.6 - 27.7 | Ch. 27.7 - 27.8<br>DC Motor Kit | HW 6 (Su) |
| 02/17 - 02/21 | Quiz 3<br>Ch. 21.5 | Ch. 21.5 - 21.6 | PhET: E-field | HW 7 (T) |
| 02/24 - 02/28 | Ch. 1.10<br>Ch. 22.1 - 22.3 | Ch. 22.3 - 22.4 | Ch. 22.5<br>Faraday Cage | HW 8 (Su) |
| 03/02 - 03/06 | Quiz 4<br>Ch. 23.1 - 23.2, 23.4 | 23.3 - 23.4<br>PhET: Voltage | 23.3, 23.5<br>PhET: Voltage | HW 9 (T) |
| 03/09 - 03/13 | No Class | No Class | No Class | None |
| 03/16 - 03/20 | Ch. 23.1 | Quiz 5<br>Ch. 24.1 | Ch. 24.2 - 24.4 | HW 10 (T) |
| 03/23 - 03/27 | Ch. 25.1 - 25.5 | Quiz 6<br>Circuit 1 | 26.1<br>Circuit 1 | HW 11 (T) |
| 03/30 - 04/03 | Ch. 26.2<br>Circuit 2 | Ch. 26.4<br>Circuit 2 | Circuit 3 | HW 12 (Su) |
| 04/06 - 04/10 | Quiz 7 | Ch. 28.1 - 28.4 | No Class | HW 13 (Th) |
| 04/13 - 04/17 | Ch. 28.5<br>Helmholtz Coil | Ch. 28.6 - 28.7 | Ch. 29.1 - 29.2<br>Induction | HW 14 (T) |
| 04/20 - 04/24 | Ch. 29.3 - 29.7 | Ch. 32.1 - 32.3<br>Ch. 15.1 - 15.3 | Ch. 32.1 - 32.3<br>Traveling Wave | HW 15 (Sa) |
| 04/27 - 05/01 | Ch. 32.4, 33.5<br>Polarization | Ch. 32.5, 15.6<br>Standing Waves | Survey<br>Photons | None |