

## Course Syllabus

### PC212: Electricity and Magnetism

Physics and Computer Science Department, Faculty of Science, Waterloo Campus  
Fall | 2019

#### Instructor Information

Name: Dr. Li Wei | Office Location N2084B

Contact Information: Phone 519-884-0710 ext. 2903, lab ext. 6610: Email: [lwei@wlu.ca](mailto:lwei@wlu.ca)

Weekly Office Hours: Friday 9:00 – 11:00 am in N2084B or by Appointment

#### Course Information

##### Course Overview

Introduction to electrostatics and magnetostatics including Gauss' law, electric potential, capacitance, electromagnetic induction. Introductory DC and AC circuit theory. Electromagnetic waves.

*Credit:* 0.50

*Prerequisite:* PC131, PC132 (or PC141 and PC142), MA122, and one of MA110\* or MA103 or MA105

Course location, meeting times and days

Section	Days	Times	Room
Lecture	MWF	10:30 am - 11:20 pm	BA210

#### Course Goals and Learning Outcomes

By the end of this course students should be able to develop a fundamental understanding of the electric and magnetic fields. More precisely, students will understand how electric and magnetic fields affect charged particles (“Lorentz Force Law” equation), and how electric and magnetic fields are produced by charged particles (four fundamental equations of electromagnetism – “Maxwell Equations”). Much of our work will be devoted to understanding the meaning of the equations and the way to apply them to specific physical situations.

### Course Textbook

David Halliday, Robert Resnick, Jearl Walker, *Fundamentals of Physics*, Volume 2 (Chapter 21 – 32), John Wiley & Sons, Inc., 11<sup>th</sup> edition.

### Course Web Page

<http://bohr.wlu.ca/lwei/PC212/index.html>

### Student Evaluation

Assessment	Weighting
Assignments	25%
Midterm	30%
Final Exam	45%
<b>Total</b>	<b>100%</b>

### Learning Activities, Assignments, and Examinations

Please note that the course notes, assignments and exam information will be posted on our course website (<http://bohr.wlu.ca/lwei/PC212/index.html>). The midterm is tentatively scheduled on Oct. 25. It will be held in class.

There are 8 assignments. They are equally weighted. Please be advised that I may randomly choose the questions that will be marked. Also there are 7 set of practice questions that are available for practice only.

In general, the assignments will be posted one week on our course website in advance of their due date. During the first 6 weeks you will have 5 assignments for each chapter (from Chapter 21 to 25). After the term study break, you will be given a midterm to test the contents from the five chapters.

During the last 6 weeks you will have 3 assignments (one for Chapter 26 & 27, one for 28 & 29, and one for chapter 30).

The assignments will help students to understand the materials and prepare them for the exams. Assignments, and examples discussed during lectures will help students to answer the questions in the final exam.

### Weekly Tentative Lecture Schedules

- Electric Charge (*Chapters 21*)
- Electric Field (*Chapters 22*)
- Gauss' Law (*Chapters 23*)
- Electric Potential (*Chapters 24*)
- Capacitance (*Chapters 25*)
- Current, Resistance and Circuits (*Chapters 26, 27*)

- Magnetic Fields, Magnetic Fields Due to Currents (*Chapters 28, 29*)
- Induction and Inductance (*Chapters 30*)
- Electromagnetic Oscillations and Alternating Current (*Chapters 31*)

Week 1	21. 1- 21.2 Electric charge	
Week 2	22.1-22.6 Electric Fields	Assignment 1
Week 3	22.7; 23.1 - 23.3 Gauss' Law	Assignment 2
Week 4	23.4-23.6; 24.1-24.8 Electric potential	Assignment 3
Week 5	25.1 - 25.3 Capacitance	Assignment 4
Week 6	25.4-25.6; Review for midterm	Assignment 5
Week 7	Midterm (Oct. 25); 26.1-26.5 Current and Resistance;	
Week 8	27.1-27.3 Circuits	
Week 9	27.4; 28.1-28.3 Magnetic field	Assignment 6
Week 10	28.5; 29.1-29.4 Magnetic field due to currents	
	30.1-30.8 Induction and Inductance	Assignment 7
Week 11	31	Assignment 8
Week 12	review for final exam	

*Please be advised this schedule may be subject to change slightly.*

## University and Course Policies

Laurier has several senate approved policy statements it requires instructors to include in their syllabus. Those with specific wording approved by senate are indicated specifically below.

1. **Academic Calendars:** Students are encouraged to review the [Academic Calendar](#) for information regarding all important dates, deadlines, and services available on campus.
2. **Special Needs:** Students with disabilities or special needs are advised to contact Laurier's Accessible Learning Centre for information regarding its services and resources.
3. **Plagiarism:** The University has approved the following wording for inclusion on all course syllabi about the use of the institutionally supported plagiarism software tool. "Wilfrid Laurier University uses software that can check for plagiarism. If requested to do so by the instructor, students are required to submit their written work in electronic form and have it checked for plagiarism." (Approved by Senate May 14, 2002).
4. **Academic Integrity:** Laurier is committed to a culture of integrity within and beyond the classroom. This culture values trustworthiness (i.e., honesty, integrity, reliability), fairness, caring, respect, responsibility and citizenship. Together, we have a shared responsibility to uphold this culture in our academic and nonacademic behaviour. The University has a defined policy with respect to academic misconduct. As a Laurier student you are responsible for familiarizing yourself with this policy and the accompanying penalty guidelines, some of which may appear on your transcript if there is a finding of misconduct. The relevant policy can be found at Laurier's [academic integrity](#) website along with resources to educate and support you in upholding a culture of integrity. Ignorance is not a defense.

5. **Classroom Use of Electronic Devices:** State your classroom practice and any consequences for student failure to comply – see [Policy 9.3](#) (Approved by Senate March 8, 2012).
6. **Late Assignment Policy:** Specify any penalties that will be assessed when deadlines for the completion of course components are not met (Approved by Senate May 23, 2012). Refer to the Handbook on Undergraduate Course Management for more information.
7. **Final Examinations:** Students are strongly urged not to make any commitments (i.e., vacation) during the examination period. Students are required to be available for examinations during the examination periods of all terms in which they register. Refer to the Handbook on Undergraduate Course Management for more information.
8. **Foot Patrol, the Wellness Centre, and the Student Food Bank:** The University approved the inclusion of information about select wellness and safety services and supports on campus in the course information provided to students. (Approved by Senate November 28, 2011.) Specific language (by campus) is provided below.

**Multi-campus Resource:**

- Good2Talk is a postsecondary school helpline that provides free, professional and confidential counselling support for students in Ontario. Call 1-866-925-5454 or through 2-1-1. Available 24-7.

**Kitchener/Waterloo Resources:**

- [Waterloo Student Food Bank](#): All students are eligible to use this service to ensure they're eating healthy when overwhelmed, stressed or financially strained. Anonymously request a package online 24-7. All dietary restrictions accommodated.
- [Waterloo Foot Patrol](#): 519.886.FOOT (3668). A volunteer operated safe-walk program, available Fall and Winter daily from 6:30 pm to 3 am. Teams of two are assigned to escort students to and from campus by foot or by van.
- [Waterloo Student Wellness Centre](#): 519-884-0710, x3146. The Centre supports the physical, emotional, and mental health needs of students. Located on the 2<sup>nd</sup> floor of the Student Services Building, booked and same-day appointments are available Mondays and Wednesdays from 8:30 am to 7:30 pm, and Tuesdays, Thursdays and Fridays from 8:30 am to 4:15 pm. Contact the Centre at x3146, [wellness@wlu.ca](mailto:wellness@wlu.ca) or @LaurierWellness. After hours crisis support available 24/7. Call 1-844-437-3247 (HERE247).