PHYS 273 TLC – Fundamentals of Physics II: Electromagnetism
Spring 2018

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As part of the online homework system for the course, you will have access to an
electronic version of the textbook. A printed version of the textbook is not required (but
you may find it helpful). You will only need “Volume 2” for this course. Make sure to
get the 1st Edition, and not the “Advance Edition”. (Note: if you still have the full version
of the Giancoli textbook from PHYS 253, you will still need this textbook if you will be
taking PHYS 283.)

We will be using *Enhanced WebAssign* as an online homework portal. To sign up, go to
the WebAssign web page (www.webassign.net), and then click on the “Enter Class Key”
button in the upper right. The code for this course is

niu 7856 6188

If you already have a WebAssign account (for example, from the PHYS 253 TLC last
semester), you can use it. Otherwise, create a new account. Access to WebAssign is free
for the first two weeks of the semester, but you will have to purchase access eventually.
You can either purchase access directly from the WebAssign website (with a credit card),
or purchase a card with an access code from the university bookstore.

Course description: PHYS 273 is the second semester of calculus-based general physics
covering physical laws governing electrostatics, electrodynamics, circuits,
magnetostatics, and Maxwell’s equations. This includes concepts of electric charge,
electric fields, magnetic fields, inductance, and both direct current and alternating current
circuits. There is one three-hour laboratory a week.
Course objectives:
By the end of the course, students will be able to
1. Analyze and solve problems or situations involving fundamental physics
   principals in the areas of electricity, magnetism, electromagnetism, and circuits.
2. Use appropriate mathematical techniques and concepts to obtain quantitative
   solutions.
3. Describe, calculate, and visualize an electric field and calculate the force in it.
4. Describe, calculate, and visualize a magnetic field and calculate the force in it.
5. Describe and understand basic electronic elements such as resistor, capacitor, and
   inductors.
6. Use Maxwell’s equations and understand their implications.

Expectations:
Students are expected to attend both the lecture portion of the course (MWF 12-
12:50pm in Faraday Hall 129) and the lab section (Tu 6:00-8:50pm in Faraday Hall 105).
All assignments need to be completed and turned in on time. Significant additional
resources and help outside of class are available and as college students it is your
responsibility to seek out these resources if you are having difficulty in the course. For
example, there is a physics help room (Faraday Hall 251), your lab TA, and the peer
leader for the course.

Cell phones and all other electronic devices must be silenced during class.

Course information will be disseminated through the Blackboard site
(http://webcourses.niu.edu).

Attendance:
Students are expected to attend all class meetings. If there are any extenuating
circumstances, arrangements need to made in advance of the absence with the instructor
(for the lecture sessions) or the TA (for the lab section). Many studies have shown that
the single biggest predictor of success in college is attending classes!

Assignments and Grading:
Your grade will be determined from a combination of in-class activities,
homework, labs, quizzes, tests, and the final. There will be approximately one homework
assignment, one in-class assignment, and several pre-lecture assignments per week.
These assignments and the due dates will be announced in class and will be posted on
blackboard. Each lab will have an associated assignment which is due at the beginning of
the next week’s lab session. There will be frequent in-class quizzes during the lecture
sessions. These quizzes cannot be made up if you miss class. There will be three in-class
exams during the semester. Finally, there is a comprehensive final exam.

Your final grade for the course will be made up of 25% for the lab portion and
75% for the lecture portion. The lecture portion of your grade will be composed of 30%
from quizzes, homework, and in-class activities, 15% for each of the three tests, and 25%
for the final.
IMPORTANT NOTE: YOU MUST PASS THE LABS TO PASS THE COURSE. THAT IS, YOUR CUMULATIVE SCORE ON THE LABS MUST EXCEED 60% OR YOU WILL RECEIVE A FAILING GRADE FOR THE COURSE.

The tentative grading scale will be:

- A: 93% and higher
- A-: 90-92%
- B+: 87-89%
- B: 83-86%
- B-: 80-82%
- C+: 77-79%
- C: 70-76%
- D: 60-69%
- F: below 60%

Late assignments will be accepted up to two days (48 hours from the original deadline) late for a 25% penalty. Assignments will be accepted up to one week late for a 50% penalty. No assignments will be accepted more than one week after the original due date.
## Course Schedule

*This schedule is tentative and subject to change.*

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Chapters</th>
<th>Lab</th>
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<tbody>
<tr>
<td>Week 1</td>
<td>Electrostatics, Coulomb's Law</td>
<td>23</td>
<td>Pre-assessment</td>
<td>MLK Day</td>
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<tr>
<td>Jan 16</td>
<td>Electric Field, Gauss' Law</td>
<td>23, 24</td>
<td>TBA</td>
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<tr>
<td>Week 3</td>
<td>Gauss' Law, Electric Potential</td>
<td>25</td>
<td>01 Intro, Error and vector analysis</td>
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<td>Jan 30</td>
<td>Potential Difference</td>
<td>26</td>
<td>02 Electrostatics</td>
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<td>Week 4</td>
<td>Electric Field and Potential</td>
<td>26</td>
<td>03 Electric Fields</td>
<td>Test 1 (chapters 23, 24, 25, 26)</td>
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<tr>
<td>Feb 6</td>
<td>Capacitors and Dielectrics</td>
<td>27</td>
<td>04 Error Analysis</td>
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<td>Week 5</td>
<td>Electric Current, Ohm's Law</td>
<td>28</td>
<td>05 Ohm's Law</td>
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<td>Feb 13</td>
<td>EMF, DC Circuits</td>
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<td>TBA</td>
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<td>Week 8</td>
<td>RC Circuits, Magnetism</td>
<td>29</td>
<td>06 The Oscilloscope</td>
<td>Test 2 (chapters 27, 28, 29)</td>
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<td>Mar 6</td>
<td>Magnetic Fields and Forces</td>
<td>30</td>
<td>07 Capacitors</td>
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<td>Week 9</td>
<td>Ampere's Law</td>
<td>31</td>
<td>08 Kirchoff's Laws</td>
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<td>Mar 19</td>
<td>Magnetic Fields in Materials</td>
<td>31</td>
<td>09 Magnetic Fields</td>
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<td>Week 10</td>
<td>Faraday's Law of Induction</td>
<td>32</td>
<td>10 Faraday's Law</td>
<td>Test 3 (chapters 30, 31, 32)</td>
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<td>Mar 26</td>
<td>Inductance, AC Circuits</td>
<td>33</td>
<td>11 AC Resonance</td>
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<td>Week 11</td>
<td>Maxwell's Equations</td>
<td>34</td>
<td>Post-assessment</td>
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<td>Apr 2</td>
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<td>Finals Week</td>
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<td>May 7</td>
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*Spring Break*

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Final exam is Monday, May 7 from 12-1:50pm
Accessibility: If you need an accommodation for this class, please contact the Disability Resource Center as soon as possible. The DRC coordinates accommodations for students with disabilities. It is located on the 4th floor of the Health Services Building, and can be reached at 815-753-1303 (V) or drc@niu.edu.

Also, please contact me privately as soon as possible so we can discuss your accommodations. The sooner you let us know your needs, the sooner we can assist you in achieving your learning goals in this course.

Academic Integrity: As detailed in the current NIU undergraduate catalog: Good academic work must be based on honesty. The attempt of any student to present as his or her own work that which he or she has not produced is regarded by the faculty and administration as a serious offense. Students are considered to have cheated if they copy the work of another during an examination or turn in a paper or an assignment written, in whole or in part, by someone else. Students are responsible for plagiarism, intentional or not, if they copy material from books, magazines, or other sources without identifying and acknowledging those sources or if they paraphrase ideas from such sources without acknowledging them. Students responsible for, or assisting others in, either cheating or plagiarism on an assignment, quiz, or examination may receive a grade of F for the course involved and may be suspended or dismissed from the university.

A faculty member has original jurisdiction over any instances of academic misconduct that occur in a course which the faculty member is teaching. The student shall be given the opportunity to resolve the matter in meetings with the faculty member and the department chair. If the facts of the incident are not disputed by the student, the faculty member may elect to resolve the matter at that level by levying a sanction no greater than an F for that course. The faculty member shall notify the student in writing whenever such action is taken, and the Office of Community Standards and Student Conduct shall receive a copy of the Academic Misconduct Incident Report indicating final disposition of the case, which will be placed in the student’s judicial file. In all matters where the charge of academic misconduct is disputed by the student or if the faculty member feels a sanction greater than an F in the course is appropriate (such as repeated offenses or flagrant violations), the faculty member shall refer the matter to the Office of Community Standards and Student Conduct making use of the Academic Misconduct Incident Report. Additional sanctions greater than an F in a course can be levied only through the University Judicial System. With regards to finding the student either responsible or not responsible for his or her action, the ruling of the Judicial Hearing Board shall be binding. In cases where there is either a finding of responsibility or an admission of responsibility by the student, any recommendations by the hearing board regarding the course grade are non-binding on the instructor, who remains solely responsible for assigning a course grade, consistent with the policies set forth in the course syllabus.