PH2200 University Physics II - Electricity & Magnetism Summer 2008

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Office Hours	Monday through Friday 10:00 a.m. – 11:00 a.m., and one-half hour following each class
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PH2200 Website	http://www.phy.mtu.edu/~weidman/ph2200/
WebCT	http://courses.mtu.edu
MasteringPhysics	http://www.masteringphysics.com

INTRODUCTION

The Fundamental Questions

Questions are crucial to learning. It's through the process of inquiry that we construct our knowledge of the natural world. We will address the following five fundamental questions in our study of electricity and magnetism:

1. What are the properties of electric charge?
2. How are electric fields created by electric charges, and how do electric charges respond to electric fields?
3. What are the fundamental physical principles by which electric circuits operate?
4. How are magnetic fields created by electric charges, and how do electric charges respond to magnetic fields?
5. How do electric and magnetic fields change with time?

The Goals

The goals of this course are for you to become familiar with the phenomena of electricity and magnetism and to develop a theory to explain those phenomena. We will continue to develop the robust problem-solving skills required by professional engineers and scientists. Our study of physics will emphasis thinking and reasoning. We will stress the use of qualitative reasoning, pictorial and graphical reasoning, and reasoning by analogy; we will also make use of mathematics to help us understand and describe patterns and relationships that exist in nature.

The Philosophy

The basic philosophy of Physics 2200 can be summarized as follows:

1. Read about it (textbook)
2. Untangle it (interactive lectures)
3. Practice with it (end-of-chapter homework)
4. Challenge yourself (web-based graded exercises and problems)

The order of the above items is very important. Your first exposure to any material will be when you read about it in the textbook (1) prior to lecture. The purpose of the textbook is to provide background for lectures, to be a resource for detailed explanations, to be a reference and a study guide, to offer practice problems, and to teach a robust problem-solving strategy.

The interactive lectures (2) will not simply regurgitate what you have read; rather, the purpose of the lectures is to be inspiring and stimulating, to clarify the textbook, to explain confusing issues, to urge you to think critically, to give you lots to think about, and to spark further interest in the material. This is not a traditional approach. Your participation is needed both prior to and during *each* lecture!

Lots of practice is required to become a proficient problem-solver. Roughly two days each week will be set aside to allow us to practice solving end-of-chapter exercises and problems (3). The problem-solving strategy used in class will be the same as that used in every example exercise in the textbook.

To cap things off, you will demonstrate what you have learned by completing web-based graded exercises and problems (4). These activities will include tutorial problems and end-of-chapter problems.

COURSE SUPPLIES

Textbook: *Physics for Scientists and Engineers*, Volume 4, Randall D. Knight (bundled with a Student Workbook and a Student Access Kit to MasteringPhysics)

i>clicker classroom response transmitter (hanging on the wall near the entrance to the Course Books section of the campus bookstore)

scientific calculator

straight edge

COURSE STRUCTURE

Your grade for Physics 2200 will be based on the total number of points that you accumulate on the various graded activities. The total possible score is 1054 points, broken down as follows:

Reading Quizzes	60
Participation	64
Graded Homework (MasteringPhysics)	200
Exam I	210
Exam II	210
Final Exam	300
MasteringPhysics Extra Credit	10

Letter grades for the course will be determined by total points earned in the following manner:

A	900-1054	C	700-749
AB	850-899	CD	650-699
B	800-849	D	600-649
BC	750-799	F	0-599

Reading Quizzes

Beginning on Tuesday, July 1st, each lecture session will begin with a single-question multiple-choice reading quiz. The classroom response system described below will be used to record your answer to the quiz question. The quiz is intended to encourage you to read the relevant assignment prior to attending lecture. The reading assignments are located on the Assignment Schedule, page 9 of this document. Twenty-three 3-point reading quizzes will be given for a total of 69 points; however, you can earn a maximum of 60 points. This allows you to miss three reading quizzes without penalty.

Reading technical material is a skill that can be developed with practice. Read actively with questions in mind. A passive approach to reading physics wastes your time. Read with a pencil and paper beside your book and jot down questions and notes. Read to learn, not merely to cover material. Be sure to answer the *Stop to Think* questions that

are sprinkled throughout each chapter - the answers with full explanations are located at the very end of each chapter. Test your comprehension of a reading assignment by completing the related exercises in the Student Workbook. After completing the workbook exercises, you can approach the end-of-chapter exercises and problems with confidence.

Participation

During each interactive lecture and each problem-solving session, you will respond to several questions using the classroom response system. Questions will be cast in a multiple-choice format, and you will answer by pressing a letter on your pocket-size wireless transmitter. Your response will be collected by a receiver mounted on the front podium and routed to the presentation computer. You will receive 2 points for responding to the majority of the questions, independent of whether your answers are right or wrong.

Two points are available for each of 36 class sessions for a total of 72 points; however, you can earn a maximum of 64 points. This allows you to miss four classes without penalty. Grading will begin on Tuesday, July 1st.

Here are some details about the classroom response system: The portable radio frequency transmitter operates with three AAA batteries. The transmitter shuts off automatically when not in use; the lifetime of the batteries is about 200 hours. In addition to the On/Off button, the transmitter has 5 buttons for choices. When a question is asked, check the Power LED to ascertain that the transmitter is on, then press your choice of letter A through E. If the Vote Status LED flashes green, your answer has been registered by the receiver; if the Vote Status LED flashes red, resubmit your answer. You may change your answer as often as you like; the system records only your latest response.

Graded Homework (MasteringPhysics)

MasteringPhysics is a state-of-the-art online tutorial and homework system. We will use two types of exercises within MasteringPhysics: tutorial problems and end-of-chapter problems. The tutorial problems have extensive hints and subparts that you may request if you get stuck. The end-of-chapter problems are derived from problems in the textbook and typically have no hints. Your individual end-of-chapter problems will be unique due to the use of random numbers for some of the numerical parameters. For all types of problems, once you submit your answers, your work will be graded instantly. You will be permitted an unlimited number of submissions for each problem part, but there will be a deduction of 3% for each incorrect answer. You will receive a 2% bonus for each unopened hint. Multiple-choice questions are graded specially: in order to discourage guessing on multiple-choice questions, if a question has n choices, each incorrect answer results in a percent loss of $100/(n\text{-}1)$ for that question. This information is summarized in MasteringPhysics by clicking on *View Grading Details* at the head of each assignment.

A total of 10 homework assignments from MasteringPhysics will be assigned for grading. Each assignment is worth 20 points, so the point total for all assignments is 200. Each assignment must be completed by 11:00 p.m. on its due date for full credit (see the Assignment Schedule on page 9 for the due dates). Partial credit will be awarded for late work as follows: A problem submitted between 0 and 24 hours after the deadline receives an amount of credit that decreases linearly from 100% to 50% depending on exactly when the problem was submitted. A problem submitted later than 24 hours after the deadline still receives 50% of possible credit. Please plan on submitting your answers well in advance of the deadline to avoid problems with the web.

The first (ungraded!) assignment is entitled *Introduction to MasteringPhysics*. This initial assignment takes about 45 minutes to complete and consists of simple exercises to help you become familiar with the use of MasteringPhysics. If you're new to MasteringPhysics, this first assignment should be completed prior to attempting the graded assignments. A description of the grading is located in Student Help > Five Ways to Improve Your Grade with MasteringPhysics > How Grading Works > How Grades are Calculated. The first graded homework is due on Sunday, July 6th, at 11:00 p.m.

MASTERINGPHYSICS REGISTRATION INSTRUCTIONS: To use MasteringPhysics, please register at the MasteringPhysics website located at http://www.masteringphysics.com. Click on MasteringPhysics for Knight: Physics for Scientists and Engineers 1e.

First time users: Click on First Time User: Register on the page that follows. Here you'll be prompted for the access code that came bundled with your textbook. As you continue with the registration process, you'll be prompted for our course ID, your MTU e-mail address, and your Student ID:

Course ID:	MTUPH2200SUMMER2008
E-mail Address:	please use your MTU e-mail address
Student ID:	your M-number (without the dash, for example, M12345678)

Prior users: Log in as an established user as you did previously. Sign up for PH2200 by entering as the Course ID: MTUPH2200SUMMER2008

Occasional problems arise with MasteringPhysics that are browser-related. If the graphics or the hints to a problem are missing, turn off the popup blocker in your browser. If you continue to have problems, try a different browser – MasteringPhysics recommends the use of Firefox. If you experience problems with the ranking tasks, be sure that you have the latest version of the Flash player installed on your computer. If the problem persists, contact me or the technical support staff at MasteringPhysics. It has been my experience that MasteringPhysics responds very quickly to requests for help.

Exams and Final Exam

The two exams and final exam are scheduled as follows:

Exam I	Friday, July 18
Exam II	Friday, August 8
Final Exam	Friday, August 15

Exams I and II will be 90 minutes long and hence will extend beyond normal class time. Students with a conflict will be accommodated by starting the exam one-half hour prior to the normal start of class. The final exam will be a comprehensive two-hour examination.

All exams will be closed book and closed notes. You may use the PH2200 formula sheet that will be included with the exam booklet. You will need a scientific calculator for the exams; however, equations may not be stored in calculators, nor may calculators be exchanged.

The exams will consist of a total of 30 conceptual questions and traditional problems; the final exam will consist of a total of 50 conceptual questions and problems. Both the questions and problems will be multiple-choice. The questions and problems will be similar to the *Stop to Think* questions and worked examples found in the textbook, the assigned end-of-chapter exercises and problems, the graded homework problems (MasteringPhysics), and questions and problems posed and answered during lecture.

It is your responsibility to appear at the scheduled times to take the exams. No late exams will be given, and an unexcused absence from any exam will result in a grade of zero.

There will be no curving, scaling, redemption, or any other adjustment of exam scores.

MasteringPhysics Extra Credit

You may earn up to 10 additional course points of extra credit by completing all of the problems identified as Extra Credit in MasteringPhysics. There are ten Extra Credit collections of problems, one for each chapter. Each of the ten Extra Credit collections of problems is worth five MasteringPhysics points for a total of fifty MasteringPhysics points. Your extra credit score that contributes to your course grade will be computed by dividing your total MasteringPhysics extra credit points by five. For example, if you earn 40 MasteringPhysics points of extra credit, 8 points will be added to your course total.

Grade Tracking - WebCT

Your reading quiz and participation scores will be updated at the end of each week and the results will be available to you in the grade book maintained in WebCT. This is where your exam scores and ultimately your course grade may be found as well. In addition to grades, I will use WebCT to release your M-number so you can make a note of it prior to the exams and to list your iclicker transmitter number so that you can verify that I have your correct number. It's your responsibility to examine the grade book periodically for accuracy and to report any discrepancies to me.

ACCESSING WebCT: WebCT is located at http://courses.mtu.edu . Your User ID is your campus email address without the @mtu.edu and, by default, your Password is the same as your user ID. If you previously used WebCT and changed your password, your updated password is needed. If you have forgotten your password, take your ID to Customer Service in room B24 of the EERC and request a new password.

ADDITIONAL INFORMATION

Formula Sheet

The formula sheet appended to this document will be provided during all exams - no other formula sheet or table is allowed. Keep the formula sheet by your side as you solve problems.

Excused Absences

Events beyond your control may cause you to miss a homework due date or an exam. Whenever possible, contact me *prior* to your absence to arrange to make-up missed work. If you are unable to notify me concerning an absence or if you need to notify several instructors on short notice, contact the Office of Student Affairs for assistance. The Dean of Students will then inform all your instructors that you face a situation that requires that you miss class, and you will be granted an excused absence. It's then your responsibility to contact each of your instructors after you recover from your illness or return to campus.

An absence is excused under the following conditions:

- If you participate in off-campus University-sponsored activities, such as field trips, fine arts performances, intercollegiate athletics, job fairs, etc. you are granted an excused absence if your activity conflicts with an exam. Furthermore, I consider plant trips, job interviews requiring travel, and professional society meetings as excusable. It is imperative that for an absence of this type, for which a conflict with an exam is known well ahead of time, that you arrange with me to take the exam *earlier* than its normally scheduled time.

- If you encounter circumstances beyond your control such as illness, the funeral of any relative or close friend, or other personal emergency, you are granted an excused absence. You must provide verification of the special circumstances that led to your absence. In the event of a missed exam due to an excused absence, you are not required to make-up the exam. Instead, an excused absence from an exam will receive the score EX. At the end of the semester, exam EX scores will be replaced by a weighted average of all of your non-EX scores on exams

(exams and final exam). If the final exam is missed as a result of an excused absence, you will be awarded the letter grade of I (incomplete) and must take the PH2200 final exam at the end of any one of the next three semesters that you're in residence. Two or more exams missed as a result of excused absences will be handled on an individual basis.

If a homework due date is missed as a result of an excused absence, you will be granted an extension after you notify me.

Getting Help

Office Hours

In order to encourage you to ask questions, I've set aside the following times for office hours: Monday through Friday 10:00 a.m. – 11:00 a.m. and one-half hour following each class. If these times are inconvenient, please let me know so that we might find a mutually agreeable meeting time.

The Physics Learning Center

The Physics Learning Center will not be open for walk-ins during the summer. However, the following three coaches are available for one-on-one appointments:

Erica Akehurst	esakehur@mtu.edu	906-281-1722
William Laffin	wjlaffin@mtu.edu	248-909-0620
Ryan Toll	rmtoll@mtu.edu	906-231-0073

All three coaches are experienced and have my complete confidence.

MasteringPhysics

Extra Credit is available using MasteringPhysics. The Extra Credit is so labeled by chapter and is located in the assignment list below the 10 graded assignments. Most of the Extra Credit consists of tutorial problems with their built-in hints.

Drop Dates

Drop date with no grade: July 9, 2008
Drop date with W grade: July 25, 2008

Late drop: If after the drop date circumstances beyond your control prevent you from completing the course, you may be a candidate for a late drop. The process does not begin with a course instructor but rather with the Dean of Students, to whom you confide the details of your situation.

MTU ADA Statement

MTU complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990 (ADA). If you have a disability and need a reasonable accommodation for equal access to education or services at Tech, please call the Associate Dean of Students at 2212. For other concerns about discrimination you may contact your advisor, department head or the Affirmative Action Office at 3310. All discussions are confidential.

Academic Dishonesty

New technologies engender new forms of cheating. Some known types of cheating and the action that will result when cheating is identified are described below.

-Giving someone else your i>clicker transmitter is just like letting someone else take a quiz or exam for you. One of the things that students have liked most about the classroom response system is the immediate feedback it provides about their conceptual understanding of important topics. You lose this learning opportunity if you give your transmitter to someone else. Reading quiz and participation points represent a small part of your grade, so it's unwise to jeopardize your academic record by cheating with the classroom response system.

-Copying someone else's answers in MasteringPhysics is cheating. MasteringPhysics now includes tools to help instructors identify cheating. In addition, the support staff at MasteringPhysics, if requested, will assist instructors to identify cheating. MasteringPhysics will prohibit students identified as cheaters from using their website.

If cheating is suspected, the matter will be referred to the Office of Student Affairs. The penalty for cheating is not less than an academic integrity warning and not more than expulsion. In each case in my experience, students caught cheating have received an F in the course.

Summary of Important Activities

Participation in Physics 2200 requires that you perform the following activities, preferably as soon as possible:

ACCESSING WebCT: WebCT is located at http://courses.mtu.edu . Your User ID is your campus email address without the @mtu.edu and, by default, your Password is the same as your user ID. If you previously used WebCT and changed your password, your updated password is needed. If you have forgotten your password, take your ID to Customer Service in room B24 of the EERC and request a new password.

MASTERINGPHYSICS REGISTRATION INSTRUCTIONS: To use MasteringPhysics, please register at the MasteringPhysics website located at http://www.masteringphysics.com. Click on MasteringPhysics for Knight: Physics for Scientists and Engineers 1e.

First time users: Click on First Time User: Register on the page that follows. Here you'll be prompted for the access code that came bundled with your textbook. As you continue with the registration process, you'll be prompted for our course ID, your MTU e-mail address, and your Student ID:

Course ID:	MTUPH2200SUMMER2008
E-mail Address:	please use your MTU e-mail address
Student ID:	your M-number (without the dash, for example, M12345678)

Prior users: Log in as an established user as you did previously. Sign up for PH2200 by entering as the Course ID: MTUPH2200SUMMER2008

PH2200 Assignment Schedule Summer 2008

Assignments are taken from the textbook *Physics for Scientists and Engineers* Volume 4 by Randall D. Knight
E&P denotes end-of-chapter exercises and problems from the textbook
SW denotes suggested practice exercises found in the Student Workbook
MP denotes tutorial problems using MasteringPhysics

Date	Assignment	Additional Practice and Extra Credit
Week 1		
June 30	Introduction and Orientation	
July 1	Read Chapter 25 Sections 1 - 4	SW Sections 25.1 – 25.4
June 2	Read Chapter 25 Sections 5 - 6 Read Chapter 26 Sections 1 - 2	SW Sections 25.5 – 25.6 SW Sections 26.1 – 26.2
July 3	Chapter 25 E&P 1, 7, 15, 19, 25, 27, 34, 41, 46, 69	MP Chapter 25: Extra Credit
July 4	Independence Day - no class	
Week 2		
July 6	**MasteringPhysics – Homework 1: Chapter 25**	
July 7	Read Chapter 26 Sections 3 - 5	SW Sections 26.3 – 26.5
July 8	Chapter 26 E&P 3, 11, 13, 17, 21, 33, 44, 50	MP Chapter 26: Extra Credit
July 9	Read Chapter 26 Sections 6 - 7 Read Chapter 27 Sections 1 - 3	SW Sections 26.6 – 26.7 SW Sections 27.1 - 27.3
July 10	Chapter 26 E&P 23, 25, 27, 29, 51, 53, 59	MP Chapter 26: Extra Credit
July 11	Chapter 27 E&P 1, 2, 3, 5, 7, 9, 11, 14, 15, 28, 29	MP Chapter 27: Extra Credit
Week 3		
July 13	**MasteringPhysics – Homework 2: Chapter 26**	
July 14	Read Chapter 27 Sections 4 - 6	SW Sections 27.4 – 27.6
July 15	Chapter 27 E&P 17, 19, 21, 23, 25, 35, 37, 39, 46, 50	MP Chapter 27: Extra Credit
July 16	Read Chapter 28 Sections 1 - 5 Read Chapter 29 Sections 1 - 3	SW Sections 28.1 – 28.5 SW Sections 29.1 – 29.3
July 17	Chapter 28 E&P 5, 7, 17, 26, 31, 33, 37, 51 **MasteringPhysics - Homework 3 : Chapter 27**	MP Chapter 28: Extra Credit
July 18	**Exam I Chapters 25 – 27**	
Week 4		
July 20	**MasteringPhysics – Homework 4: Chapter 28**	
July 21	Read Chapter 29 Sections 4 - 7	SW Sections 29.4 – 29.7
July 22	Chapter 29 E&P 1, 5, 9, 15, 21, 29, 31, 37, 45, 53, 71	MP Chapter 29: Extra Credit
July 23	Read Chapter 30 Sections 1 - 3 Read Chapter 30 Sections 4 - 7	SW Sections 30.1 – 30.3 SW Sections 30.4 – 30.7
July 24	Chapter 30 E&P 1, 5, 13, 19, 28, 33, 54, 65, 72 **MasteringPhysics – Homework 5: Chapter 29**	MP Chapter 30: Extra Credit
July 25	Read Chapter 31 Sections 1 - 4	SW Sections 31.1 - 31.4

Date	Assignment	Additional Practice and Extra Credit
Week 5		
July 27	**MasteringPhysics – Homework 6: Chapter 30**	
July 28	Read Chapter 31 Sections 5 - 7	SW Sections 31.5 – 31.7
July 29	Read Chapter 31 Sections 8 - 10	SW Sections 31.8 – 31.10
July 30	Chapter 31 E&P 6, 7, 11, 15, 21, 25, 29, 40, 53, 63, 77 Read Chapter 32 Sections 1 - 3	MP Chapter 31: Extra Credit SW Sections 32.1 – 32.3
July 31	Read Chapter 32 Sections 4 - 6 **MasteringPhysics – Homework 7: Chapter 31**	SW Sections 32.4 – 32.6
August 1	Chapter 32 E&P 2, 7, 15, 17, 23, 24, 46, 50, 61	MP Chapter 32: Extra Credit
Week 6		
August 3	**MasteringPhysics – Homework 8: Chapter 32 Sections 1-6**	
August 4	Read Chapter 32 Section 7	SW Sections 32.7
August 5	Read Chapter 32 Sections 8 - 10	SW Sections 32.8 – 32.10
August 6	Chapter 32 E&P 27, 30, 34, 37, 38, 41, 62, 71, 72 Read Chapter 33 Sections 1 - 4	MP Chapter 32: Extra Credit SW Sections 33.1 - 33.4
August 7	Read Chapter 33 Sections 5 - 7 **MasteringPhysics – Homework 9: Chapter 32 Sections 7 - 10**	SW Sections 33.5 - 33.7
August 8	**Exam II Chapters 28 - 32**	
Week 7		
August 11	Chapter 33 E&P 1, 5, 6, 7, 9, 12, 13, 27, 32, 44, 49	MP Chapter 33: Extra Credit
August 12	Read Chapter 34 Sections 4 - 6	SW Sections 34.4 – 34.6
August 13	Read Chapter 34 Sections 7 - 8 Chapter 34 E&P 17, 21, 27, 29, 31, 35, 47, 49	SW Sections 34.7 – 34.8 MP Chapter 34: Extra Credit
August 14	no class - prepare for final exam **MasteringPhysics – Homework 10: Chapter 33**	
August 15	**Final Exam Chapters 25 – 34**	