

# Online College Physics II (Physics 1220) Syllabus

## COURSE OBJECTIVES (Learning Outcomes)

There are two major objectives in this course:

1. To build a strong and robust understanding of the fundamental concepts of physics
2. To develop the skills of applying physics principles and laws to solve problems

Upon successful completion of this course, learners will be able to:

1. Describe the fundamental concepts in electricity, magnetism, optics, special relativity, quantum physics, atomic and nuclear physics
2. Identify the key factors involved in the fundamental concepts, and the impacts of changes in these factors on the quantities that are related to the concepts
3. Apply physics principles and laws to solve problems related to electricity, magnetism, optics, special relativity, quantum physics, atomic and nuclear physics. The problem solving is at two levels: the direct application of individual concepts/principles, as well as the synthesis of multiple concepts/principles.

## COURSE INFORMATION

**Course Number & Title: (100% Online) Physics 1220, College Physics II**

**Course Description:** This is the second course in the algebra-based introductory physics series. It covers electricity and magnetism, optics, special relativity, quantum physics, atomic and nuclear physics.

**Prerequisite(s):** College Physics I (with a grade of **C- or better**)

### Required Textbook/Materials

Textbook: Physics, Volume 2, 5th Ed., by James S. Walker, Pearson/Addison-Wesley.

MasteringPhysics access code for Online homework assignments (can be purchased separately from the textbook)

**Technical Help:** If you are having any technical difficulties (e.g., logging in, accessing the discussion board) please email [helpdesk@missouri.edu](mailto:helpdesk@missouri.edu) or contact the *DoIT Help Desk* (for out-of-area MizzouOnline students, toll-free at 866/241-5619).

## COURSE COMPONENTS

- Pre-recorded lecture videos (with accompanying notes in pdf files), textbook reading
- Online discussions (graded based on participation)
- Additional practice problems (Graded based on attempt, not on the correctness.)
- Assignments (graded) on Masteringphysics website.
- Labs (graded)
- Online conceptual quizzes (graded)
- 3 proctored exams (graded) on paper

All the learning activities are designed to help you achieve the goals of the course. Specifically,

- In the lecture videos, I introduce and discuss fundamental physics concepts and laws. I also post conceptual questions for you to identify the correct descriptions of concepts and their key factors prior to giving my explanations. These questions are meant to prompt you to review the lectures, or/and to clarify typical confusions, or/and to correct typical misconceptions.

In the lecture videos, I use examples to show how to apply the newly introduced concepts /principles/ laws to solve problems (These examples focus on the new topics). Some examples involve previously learned topics (these examples are to demonstrate how multiple concepts / principles can be synthesized into more comprehensive problems and how to solve them).

**The examples in lectures serve as the first step in building your problem solving skills. Therefore it is very important that you be able to solve all the lecture examples ON YOUR OWN before moving on to solving more problems.**

The textbook gives more explanations of concepts, and provides additional conceptual questions and quantitative examples.

- Online discussions give you chances to exchange thoughts with and learn from others.
- The additional Practice Problems are carefully selected to consolidate and enhance your understanding of the concepts and your problem-solving skills. I truly believe that you will benefit to the maximum if you make attempt to solve these problems on your own before looking at the solutions. Therefore, I require you to submit your attempt before releasing the solutions.
- You will practice describing fundamental concepts and identifying their key factors and applying them in the Assignments on MasteringPhysics. The Assignments on Masteringphysics website have conceptual questions and quantitative problems. Some quantitative problems involve applications of individual concepts/principles, and there are plenty of multi-step and multi-concept problems.
- You will have another chance to apply your skills of conceptual description/ identification and problem-solving in lab simulations activities. Some lab activities are exploratory – you perform qualitative and/or quantitative experiments and summarize the experimental results into physics laws. In other labs you perform experiments, and apply physics concepts / principles and /or use calculations to explain the experimental results. Some of the labs include additional conceptual questions and additional problem-solving exercises.

## COURSE POLICIES

- Group discussions: I will post conceptual questions on the “Required Discussions” for you to discuss. Grading is based on participation only. This category counts a total of 50 points (capped) to the final grade.
- Practice Problems: There are 21 sets of practice problems. You are required to attempt these problems on your own first and submit your attempt. Grading is based on the effort you make, not on the correctness. Submission of each set counts 5 points before due time. Late submissions (up to two days) are acceptable with 1 point deduction for each day late. This category is capped at 50 points to buffer all the inconveniences. Fully worked-out solutions are available after the late submission deadlines.
- Homework Assignments: For the homework assignments on Masteringphysics, a tutorial is to provide you with information on completing and submitting your assignments. For each problem in assignments (on masteringphysics website), you are allowed 5 attempts. You

don't have to use all the 5 attempts in one sitting. Also for each assignment you don't have to finish all the problems in one sitting. For the problems that you enter answers, there is no credit deduction for wrong answers submitted before exhausting the 5 attempts. For the multiple-choice questions, there is credit deduction for wrong answers (to prevent random guessing).

Late submissions after the due time are acceptable with discounted credits. Check the "Grading Policy" for details. If you have circumstances that affect your ability to complete assignments, please contact me at least 3 days in advance of the due date.

All the assignments will collectively contribute 200 points (capped) to the final grade (points beyond 200 will be discarded in calculating the final grade). To buffer all the inconveniences, there is a total of 258.25 points available.

- **Labs:** There are 6 simulation labs in the course. You will follow detailed instructions in the lab files to perform activities from the [Physics Education Technology Web](http://phet.colorado.edu/simulations/) site (<http://phet.colorado.edu/simulations/>). You are required to answer questions related to the activities. Some of the labs include additional questions and additional problem-solving exercises, which you are also required to do.

Late submissions after the due time are acceptable, with 2 points deduction for each day late, up to three days after the due time. Lab work more than 3 days late will not be accepted unless **prior** arrangements have been made.

Point allocations for the 6 labs are: Lab 01 (30 points), Lab 02 (25 points), Lab 03 (30 points), Lab 04 (30 points), Lab 05 (25 points), and Lab 06 (10 points). For each lab, there is a file detailing points breakdown, so that you can check points deductions for the errors you make and discuss with the teaching assistant who grades the labs. The 6 labs collectively contribute 150 points to the final grade. You must pass the lab component (more than 75%) to pass the course.

Students who have taken Physics 1220 before can opt to have their average lab grade transferred to this course instead of performing the labs again. If you select this option, contact your previous instructor for physics 1220 and ask him/her to email your lab scores to the instructor.

Alternatively, you can redo all labs.

- **Quizzes:** This course uses online quizzes to assess your understanding of the fundamental physics concepts. There is one quiz in each topic. There is also a syllabus quiz at the beginning of the course. Quizzes are timed. You may take each quiz TWICE and the highest score will be counted. **Under NO circumstance will late submission be allowed.** (This is because answers will be released after the due times.) All the quizzes are made available on the first day of the summer semester, check the calendar for the due times of the quizzes, plan ahead so that you will not miss any quiz.

All the quizzes (including the syllabus quiz) will collectively contribute 100 points (capped) to the final grade. There is a total of 125 points available to buffer all the inconveniences.

- **Exams:** This course has three Proctored Exams taken on paper. The exact dates are clearly marked in the Course Calendar. The Mizzou Online Office has the instructions on administrating the exams, and will arrange for the proctored exams. It is **extremely important that you register with the Mizzou Online Office BEFORE the designated deadlines (these deadlines are well before each exam.) Failing to do so will result in your losing the chance to take the exams, and your requests for make-up exams will be rejected.**

All exams: closed book, closed notes, a formula sheet will be provided.

Each exam contributes 150 points to the final grade.

Make-up Exams: The make-up exams will be given only under exceptional and documented circumstances. If you cannot take the exams on the scheduled dates, you must contact the instructor well in advance to get permission to take Make-up exams. In case of medical emergencies, you should contact the instructor and provide medical documentation as soon as possible to make arrangements for make-up exams. Make-up exams may not be in the same format as the regular exams.

Re-grading policy: You have the chances to discuss with the graders (either the instructor or the teaching assistant) about the grading of the exams and the lab work. Re-grading an exam or a lab amounts to a careful re-evaluation of the problem(s) you wish the grader to reconsider. In the process, the grader may find that additional points are warranted, that the problem was given all the points it deserved, or that the problem was given too many points. In any case, the grader will correct the score. So be aware that when you submit your re-grading request, your score may go up, stay the same, or go down.

## COMMUNICATIONS and FEEDBACK

**DISCUSSION BOARD:** The Discussion Board is divided into two parts: the general (voluntary, ungraded) part and the required (graded) part.

The “General Discussion Board” is where all the participants of this course including students, instructor and teaching assistant introduce themselves and communicate about the course contents in general. It has been organized by topics (Forums). Each topic (forum) is also organized by learning activities. Post questions in the correct Forums and correct Threads so that it is easy for other people to follow. Before posting a question, make sure to read the threaded discussions to check if your questions have been answered. I as well as the teaching assistant will be monitoring this discussion board throughout the week and can respond to general questions there.

The “Required Discussions” is where you participate in group discussions on conceptual problems.

### Feedback

- Assignments on Masteringphysics: immediate feedback to each question of assignments is provided by the online system. In addition, after the due time of each assignment, I will look at your performance and contact you if I see that you have difficulty.
- Practice problems: fully worked-out solutions are available after the late submission deadlines.
- Labs: your submitted lab works will be graded within 3 days after being received, and lab grades will be posted. In case of logistic difficulties, announcements will be made about the adjusted timelines. You can request copies of your graded lab work.
- Online Quizzes: quizzes will be graded immediately upon submission. Grades will be posted after the due times. Correct answers and submitted answers are available after the due times.
- Exams: exams will be graded within 5 days after being received and grades will be posted. In case of logistic difficulties, announcements will be made about the adjusted timelines. You can request copies of your graded exams.

### PRIVATE CONCERNS

If you have any private concerns, please use the course instructor or TA email,

## ONLINE CLASS NETIQUETTE

Your instructor and fellow students wish to foster a safe on-line learning environment. All opinions and experiences, no matter how different or controversial they may be perceived, must be respected in the tolerant spirit of academic discourse. You are encouraged to comment, question, or critique an *idea* but you are not to attack an *individual*. Please consider that sarcasm and humor can be misconstrued in online interactions and generate unintended disruptions. Working as a community of learners, we can build a polite and respectful course ambience.

## GRADING SCALE

Here is the grade breakdown for the components of this course.

Components	Point Total
Required Discussions in groups	50 points (Capped)
Required Practice Problem attempts	50 points (capped)
Assignments on masteringphysics	200 points (capped)
6 Labs	150 points
Quizzes (including the syllabus quiz)	100 points (capped)
3 exams	150 points x 3 = 450 points
<b>Total</b>	<b>1000 points</b>

Points	Grade
< 600	<b>F</b>
601 - 700	<b>D</b>
701 - 730	<b>C-</b>
731 - 770	<b>C</b>
771 - 800	<b>C+</b>
801 - 830	<b>B-</b>
831 - 870	<b>B</b>
871 - 900	<b>B+</b>
901 - 930	<b>A-</b>
931 - 960	<b>A</b>
> 961	<b>A+</b>

## COURSE STRUCTURE and TOPICS

Units	Topics	Reading & learning materials	Assignments/Labs /Quizzes/Exams
<b>Unit 1</b> <b>Electricity</b>	Introduction	Introduction/ Vectors Review (Lecture 00)	Syllabus Quiz Practice 00
	Topic 01: Electric Charges, Forces and Fields	Lecture 01 – 05 textbook Ch. 19	Practice 01 Assignment 01 Quiz 01
	Topic 02: Electric Potential and Electric Potential Energy	Lecture 06 – 11 textbook Ch. 20	Practice 02A, 02B Assignment 02 Quiz 02 Lab 01

	Topic 03: Electric Current and Direct-Current Circuits	Lecture 12 – 18 textbook Ch. 21	Practice 03A, 03B Assignment 03A, 03B Quiz 03 Lab 02
<b>Unit 2</b> <b>Magnetism</b>	Topic 04: Magnetism	Lecture 19 – 22 textbook Ch. 22 <a href="#">EXAM 1 includes Lectures 00 - 22</a>	Practice 04A Assignment 04A, Quiz 04A
	Magnetism (continued)	Lecture 23 – 24 textbook Ch. 22	Practice 04B Assignment 04B Quiz 04B Lab 03
	Topic 05: Magnetic Flux and Faraday's Law of Induction	Lecture 25 – 28 textbook Ch. 23	Practice 05A, 05B Assignment 05 Quiz 05 Lab 04
<b>Unit 3</b> <b>Geometrical Optics</b>	Topic 06: Geometrical Optics	Lecture 29 – 35 textbook Ch. 26	Practice 06A, 06B Assignment 06A, 06B Quiz 06A Lab 05
	Topic 06: Optical Instruments	Lecture 36 – 37 textbook Ch. 27	Practice 06C Assignment 06C Quiz 06C
<b>Unit 4</b> <b>Physical Optics</b>	Topic 07: Electromagnetic Waves	Lecture 38 – 40 textbook Ch. 25 <a href="#">EXAM 2 includes Lectures 23 – 40</a>	Practice 07 Assignment 07 Quiz 07
	Topic 08: Physical Optics: Interference and Diffraction	Lecture 41 – 43 textbook Ch. 28	Practice 08 Assignment 08 Quiz 08
<b>Unit 5</b> <b>Modern Physics</b>	Topic 09: Relativity	Lecture 44 – 47 textbook Ch. 29	Practice 09A, 09B Assignment 09 Quiz 09
	Topic 10: Quantum Physics	Lecture 48 – 52 textbook Ch. 30	Practice 10A, 10B Assignment 10 Quiz 10 Lab 06
	Topic 11: Atomic Physics	Lecture 53 - 55 textbook Ch. 31	Practice 11A, 11B Assignment 11 Quiz 11
	Topic 12: Nuclear Physics	Lecture 56 - 59 textbook Ch. 32 <a href="#">EXAM 3 includes Lectures 41 - 59</a>	Practice 12 Assignment 12 Quiz 12

## Minimum Technology Requirements

To complete this course you will need on a daily basis:

- 1) access to a computer with a modern/updated Web browser (e.g., desktop, laptop, or tablet computer)
- 2) a working internet connection with "Basic Broadband" access (i.e., download speed of 3 mb/s or higher)
- 3) a browser that supports graphics, runs JavaScript, and accepts cookies.
- 4) a quality virus-protection software especially critical if you are accessing coursework from a computer on a network that is not protected by regularly updated virus-protection software.

## Accommodations

If you anticipate barriers related to the format or requirements of this course, if you have emergency medical information to share with me, or if you need to make arrangements in case the building must be evacuated, please let me know as soon as possible.

If disability related accommodations are necessary (for example, a note taker, extended time on exams, captioning), please register with the Office of Disability Services (<http://disabilityservices.missouri.edu>), S5 Memorial Union, 573- 882-4696, and then notify me of your eligibility for reasonable accommodations.

For more information, please contact: Disability Center at MU

Address: S5 Memorial Union, Columbia, MO 65211

Voice: 573-882-4696 | VP: 573-234-6662 | Fax: 573-884-5002

E-mail: [disabilitycenter@missouri.edu](mailto:disabilitycenter@missouri.edu)

Office Hours: Monday-Friday, 8:00 a.m.–5:00 p.m.

## Academic Dishonesty

Academic honesty is fundamental to the activities and principles of a university. All members of the academic community must be confident that each person's work has been responsibly and honorably acquired, developed, and presented. Any effort to gain an advantage not given to all students is dishonest whether or not the effort is successful. The academic community regards academic dishonesty as an extremely serious matter, with serious consequences that range from probation to expulsion. When in doubt about plagiarism, paraphrasing, quoting, or collaboration, consult the course instructor. Academic Dishonesty includes but is not necessarily limited to the following:

- Cheating or knowingly assisting another student in committing an act of cheating or other academic dishonesty.
- Plagiarism which includes but is not necessarily limited to submitting examinations, themes, reports, drawings, laboratory notes, or other material as one's own work when such work has been prepared by another person or copied from another person.
- Unauthorized possession of examinations or reserve library materials, or laboratory materials or experiments, or any other similar actions.
- Unauthorized changing of grades or markings on an examination or in an instructor's grade book or such change of any grade report.

**Academic Integrity Pledge:** Students are expected to adhere to this pledge on all graded work whether or not they are explicitly asked in advance to do so: I strive to uphold the University values of respect, responsibility, discovery, and excellence. On my honor, I pledge that I have neither given nor received unauthorized assistance on this work. The University has specific academic dishonesty administrative procedures. Although policy states that cases of academic dishonesty must be reported to the Office of the Provost for possible action, the instructor may assign a failing grade for the assignment or a failing grade for the course, or may adjust the grade as deemed appropriate. The instructor also may require the student to repeat the assignment or to perform additional assignments. In instances where academic integrity is in question, faculty, staff and students should refer to Article VI of the Faculty Handbook. Article VI is also available in the M-Book. Article VI provides further information regarding the process by which violations are handled and sets forth a standard of excellence in our community. *In the event of a suspected incident of misconduct, the instructor will give the student a zero for the assignment/exam and plans to use option B of the M-Book guidelines on reporting offenses. (M-Book, ARTICLE VI - ACADEMIC INTEGRITY: 6. Option B)*

## Intellectual Property Notice

All course materials including but not limited to the syllabus, course assignments, study guides, learning guides, online lecture videos and content, and lab book (i.e. course pack) are property of the instructor and University and may not be shared online or distributed in any manner to others. Students are prohibited from posting course materials or notes online and from selling notes to or being paid for taking notes by any person or commercial firm without the express written permission of the professor teaching this course. Doing so will constitute both an academic integrity violation and a copyright violation. Violations of copyright laws could subject you to civil

penalties and criminal liability. Violations of academic integrity may subject you to disciplinary action under University policies.

## Intellectual Pluralism

The University community welcomes intellectual diversity and respects student rights. Students who have questions or concerns regarding the atmosphere in this class (including respect for diverse opinions) may contact the departmental chair or divisional director; the director of the Office of Students Rights and Responsibilities; the