Wright College
Physics 222-HJL Course Syllabus
Spring 2015

COURSE INFORMATION

Course Number:	Physics 222
Course Name:	Electricity, Light and Modern Physics
Course Length:	1 academic semester
Course Hours:	5 credit hours, 8 contact hours
Course Location:	**Classes:** S335 **Labs:** S326
Class Times:	Tue & Thur 12:30pm – 4:20pm
Prerequisites:	Grade of C or better in Physics 221 and Math 141, and eligibility for English 101 or Consent of Department Chairperson.

INSTRUCTOR INFORMATION

Instructor:	Dr. Andrew Kruger
Office Location:	L389, Tel. (773) 481-8384
Email:	akruger@ccc.edu
Office Hours:	Tue & Thur 9:45am – 11:30am
Dept. Secretary:	L378, Tel. (773) 481-8377

COURSE RESOURCES

Required Text:	<u>Physics: Principles with Applications</u>. Douglas C. Giancoli, 7th Edition by Pearson Education, Inc. ISBN: 0-321-62592-7
Course Websites:	http://ccc.blackboard.com http://akruger.weebly.com (if asked for a password to access anything, use "wright")
Course Materials:	Notebook and paper for notes and homework, and a scientific calculator.

COURSE OBJECTIVE/OVERVIEW

Catalog Description: Continuation of Physics 221. Exploration of Electromagnetism, Light and Modern Physics using an algebra based approach. Writing assignments, as appropriate to the discipline, are part of the course.

Objective: This course is designed to provide students with a basic understanding of electromagnetism, optics, relativity, quantum theory, nuclear physics, and particle physics. Students will build a solid base in these topics by learning the fundamental concepts and by developing the necessary problem solving skills. This will be accomplished by means of classroom lectures, laboratory experiments, and problem assignments. This course is expected to serve students in liberal arts, health, architecture, or technical curricula.

Method of Instruction: The format will be a combination of direct instruction lecture style, followed by activities like cooperative learning, and internet use for virtual experiments. Special attention is given to laboratory sessions.

CLASS PARTICIPATION

Students are expected to participate in class lectures. Questions will be given as part of the lectures which students will answer using electronic response clickers. The responses will be graded and will count toward the student's grade. Students must sign in each class with their clickers in order to receive credit for the day. If a student is absent for part of class, it is their responsibility to obtain class notes from another class member.

HOMEWORK

Homework will be fulfilled through the on-line application http://www.masteringphysics.com. Homework must be finished by the date and time indicated in the assignment. Late assignments will be deducted 20%. Any late homework must be turned in by the day of the exam in which the chapter is covered, before the exam is started, and will not be accepted after that.

LABORATORY EXPERIMENTS

Labs will take place in S326 rather than the regular classroom unless otherwise notified by the instructor. Lab work has to be fulfilled during classtime on those assigned days. Because labs require in-class experiments, they cannot be made up if the student is absent. If a student is more than 15 minutes late, they will be considered absent and will not get credit for doing the lab. Students must hand in their own, unique lab reports. If two students hand in copies of the same lab report, both students will receive a zero for that lab. The due dates for the labs are given on the calendar, typically due one week after the lab was performed. Lab reports must be typed and turned in through a TurnItIn link that will be provided on Blackboard by the due date and time given. Late Labs will be deducted 20%. Any late labs must be turned in by the day of the exam in which the chapter is covered, before the exam is started, and will not be accepted after that (except those labs indicated in the schedule).

QUIZZES AND TESTS

Quizzes: Quizzes will be given for each chapter after the chapter has been taught. These will act as mini-tests to prepare the students for unit exams. If a student is more than 10 minutes late to class, they may not participate in the quiz. The lowest quiz grade will be dropped.

Exams: There will be four unit exams. Exams cannot be made up if missed, regardless of the reason. The lowest unit exam grade will be dropped. In the case of a unit exam being missed, that will be the score that gets dropped. Any late homework or labs from the unit must be turned in *before starting the unit exam*, and exams must be finished within the class period it is given.

Exit Exam: There will be an exit exam for this course prepared by the department which students are required to be present for and pass in order to pass the class. It will also count toward their final grade. If a student does not pass the Exit Exam and is not failing the class, they may take the Exit Exam Appeal.

METHODS OF EVALUATION

Weighted Grading: Students will be evaluated according to the following weighted formula:

Class Participation	10%
Homework	10%
Laboratory Experiments	10%
Quizzes	15%
Unit Exams	45%
Exit Exam	10%

Grade Scale: Final grades will be computed according to the following scale:

$90\% \leq A \leq 100\%$
$80\% \leq B < 90\%$
$65\% \leq C < 80\%$
$50\% \leq D < 65\%$
$0\% \leq F < 50\%$

COMMUNICATION

Any announcements about the course will be made in class as well as through the "Announcements" section of Blackboard. It is the responsibility of the student to update their email on Blackboard so they will receive any course announcements. Changes to the calendar will be announced, and an updated calendar will be uploaded to akruger.weebly.com. If you have any questions or concerns, please feel free to email the instructor at akruger@ccc.edu. While the instructor will always try to respond in a timely manner, be warned that any emails sent in the evening may not be received until the following day.

SUPPORT SERVICES

Wright College is committed to your success. Below you will find a list of offices you may wish to contact during the semester for assistance:

Academic Support Center (Tutoring)	Room A-245
Center for Academic Success (Advising)	Room A-120
Writing Center (for help with papers)	Room L-212
Wright in Your Corner (Student Center)	Room S-100
Financial Aid	Room A-128
Business Services	Room A-138
Math Tutoring	Room L-125 or L-300
Wellness Center (Personal Counseling)	Room S-132 - (773) 481-8634

EXPECTED OUTCOMES

Measurable Student Learning Outcomes: Upon successful completion of this course, students will be able to:

1. Use Coulomb's law to calculate the electric force between pairs of charges.
2. Calculate the force on a charge in an electric field.
3. Calculate the electric field of a charge or a group of charges.
4. Calculate the potential energy change of a charge when moves through a potential difference.
5. Calculate the potential of a point charge or a group of charges.
6. Solve problems involving moving charges using energy principles.
7. Solve capacitor problems involving capacitance, charge, energy, and dielectrics.
8. Solve series, parallel, and combination capacitor circuits.
9. Calculate current, voltage and resistance using Ohm's law.
10. Solve series, parallel, and combination resistor circuits.
11. Determine the power in an electric circuit.
12. Calculate the RMS voltage and current in an AC circuit.
13. Use the EMF and internal resistance of a battery to find its terminal voltage.
14. Use Kirchhoff's rules to solve more complicated circuits.
15. Calculate time constants of RC circuits.
16. Calculate the magnetic force on moving charges and currents.
17. Calculate the magnetic field of a long wire.
18. Solve force and torque problems involving wires and motors.
19. Calculate the speed, radius and frequency of circular orbits of charges in a magnetic field.
20. Solve electromagnetic induction problems using Faraday's law.
21. Calculate the output of a generator.
22. Calculate the inductance of a coil of wire.
23. Calculate primary and secondary voltages and currents in transformers.
24. Identify different portions of the electromagnetic spectrum.
25. Solve optics problems involving refraction and reflection.
26. Draw principle ray diagrams for lenses and mirrors.
27. Calculate the focal length and image position for lens and mirror systems.
28. Solve problems involving the interference and diffraction of light.
29. Calculate relativistic time dilation, length contraction, momentum, and energy.
30. Solve photoelectric effect problems for photon wavelength, electron energy, and work function.
31. Calculate the quantum wavelength of moving particles.
32. Calculate the energy levels and spectrum of hydrogen using Bohr's model.
33. Use Heisenberg's uncertainty principle to calculate limits of measurements of position, momentum, energy, and time.
34. Describe the structure of the nucleus of an atom.
35. Predict the resulting nuclei produced by alpha, beta, and gamma radioactivity.
36. Calculate the energy released in nuclear processes such as radioactivity, fission, and fusion.
37. Calculate radiation rate and dosage.
38. Identify the basic particles of the Standard Model.

CLASS POLICIES

Classroom Etiquette: Please turn off or silence your cell phones. Absolutely no food or drink is allowed in the lab. If food in the classroom creates a distraction, the student may be asked to remove it from the class. Students should maintain a respectful environment for their fellow classmates. Disruptive behavior will not be tolerated and may lead to the student being dismissed from the class.

"No Show" Policy: If a student registered for the course before the start time of the first class period but is absent from the first two class sessions, and has not contacted his/her instructor of intent to pursue the course, he/she will have his/her registration canceled by the college and will be given NSW (no show withdrawal) status.

Active Pursuit: District and college attendance policies are listed in the college catalog and the Student Policy Manual: http://www.ccc.edu/departments/Documents/studentpolicymanual.pdf. Active pursuit of this course constitutes participation in 50% of 1) lectures, 2) homework, 3) quizzes and 4) exams. It also requires the successful completion of 50% of laboratory experiments, where completion refers to attendance, full participation, and submission of a report. *A student who is not actively participating in any one of the areas described above can be dropped at the mid-term and receive a grade of ADW.*

UNIVERSITY POLICIES

Disabilities: Any student with a disability, including a temporary disability, who is eligible for reasonable accommodations should contact the Disability Access Center located in room L135, Learning Resource Center of the Wright North Campus or call (773) 481-8016 as soon as possible.

Academic Integrity: The City Colleges of Chicago is committed to the ideals of truth and honesty. In view of this, students are expected to adhere to high standards of honesty in their academic endeavor. Plagiarism and cheating of any kind are serious violations of these standards and will result, minimally, in receiving a zero for the assignment without being eligible to be dropped as one of the lowest grades. In the case of multiple offenses or cheating during an exam, the student will receive a grade of "F" for the course, and further disciplinary action may be taken.

Student Conduct: City Colleges of Chicago students are expected to conduct themselves in a manner which is considerate of the rights of others and which will not impair the educational mission of the College. Misconduct for which students are subject to College Discipline (e.g. expulsion) may include the following: (1) all forms of dishonesty such as stealing, forgery, (2) obstruction or disruption of teaching, research, administration, disciplinary proceeding, (3) physical or verbal abuse, threats, intimidation, harassment, and/or other conduct that threatens or endangers the health or safety of any person, and (4) carrying or possession of weapons, ammunition or other explosives.