



Course Syllabus - Physics 110 (CRN 21184) - Spring 2025

Basic Course Information

Semester:	Spring 2025	Instructor Name:	Dr. Alejandro Cozzani
Course Title & #:	Physics 110	Email:	alex.cozzani@imperial.edu
CRN #:	21184	Webpage (optional):	Refer to Canvas
Classroom:	2731	Office #:	2776
Class Dates:	February 10, 2025-June 06, 2025 Last Day to Add: 02/22/25 Drop Deadline with W: 05/10/25	Office Hours:	Monday: 7:30-8:00 AM Tuesday: 7:30-8:00 AM and 12:00-1:00 PM (online) Wednesday: 7:30-8:00 AM Thursday: 7:30-8:00 AM and 12:00-1:00 PM (online).
Class Days:	Monday & Wednesday	Office Phone #:	760-355-5760
Class Times:	8:00 AM-11:10 AM	Emergency Contact:	Silvia Murray 760-355-6201
Units:	4.0 (3.0 Lecture/1.0 Lab)	Class Format/Modality:	In person

Course Description

This is the second course in a two-semester physics sequence. This course is intended for students not majoring in physics or engineering but needing a one-year course in physics as a requirement for their major program.

The course is part of a two-semester sequence whose contents may be offered in other sequences or combinations. Core topics include optics, electricity and magnetism and atomic and nuclear physics.

Course Prerequisite(s) and/or Corequisite(s)

Completion of Physics 105

Student Learning Outcomes

1. Students will demonstrate an understanding of the basics of the fields of electricity, magnetism, wave mechanics, optics, and modern physics, and their corresponding physical laws by correctly describing and identifying the concepts relevant to these fields.
2. Given new situations, by using various trigonometric and algebraic techniques with some discussion of relevant calculus concepts students will correctly solve a variety of physical situations by a proper application of the principles, laws, and concepts of physics.
3. Given a particular laboratory physical objective in electricity, magnetism, wave mechanics, optics, or modern physics, students will correctly construct a physical system, learn to use and manipulate laboratory apparatus, and correctly make and analyze measurements of these physical systems and write a lab report.

Course Objectives

Upon successful completion of the course the student should be able to:



1. Outline and apply the fundamental concepts of static electricity.
2. Describe, use, and synthesize the concepts of electric field and electric potential.
3. Recognize and discriminate the basic components of a DC electrical circuit
4. Solve problems involving DC electrical circuits.
5. Apply and adapt conservation of energy and conservation of charge (Kirchhoff's laws)
6. in the solution of DC circuits.
7. Analyze and use the fundamental concepts of magnetism.
8. Investigate the effects of changing magnetic fields using Faraday's and Lenz's laws
9. Recognize and discriminate the basic components of an AC electrical circuit.
10. Use and synthesize the concepts of electricity and magnetism in the understanding of electromagnetic waves.
11. Understand and characterize the connection between electromagnetic waves and light.
12. Describe and solve basic problems involving light - both geometrical and physical optics.
13. Explore and examine the transition from classical theory to the theory of relativity.
14. Understand and apply the principles of the special theory of relativity to solve problems.
15. Investigate and recognize the limitations of classical physics which necessitated the introduction of quantum theory.
16. Understand, explain, and diagram the fundamental structure of atoms and nuclei.
17. Develop and utilize calculus techniques for the analysis of topics such as the electric field of a line charge and RC circuits.
18. Support, practice, and synthesize the above learning objectives through directed laboratory work.
19. Apply fundamental physical concepts to understand life-science phenomena and solve physical problems involving living systems.

Textbooks & Other Resources or Links

Textbooks (either one):

1. College Physics (2nd edition); Urone, P. and Hinrichs, R. Openstax.;2022. ISBN 978-1-951693-60-2.
2. College Physics (11th edition). Young, H. Adams, P., Chastain, R. Pearson. 2019. ISBN 978-0134876986.
3. College Physics (4th edition). Gianpattista, A. Mc Graw Hill Education. 2019. ISBN 978-0073512143.
4. Physics (10th ed.) Cutnell, John D.; Johnson, Kenneth W; Wiley; 2018. ISBN 978-0471713982
5. College Physics (10th Edition), Serway, Raymond A.; Faughn, Jerry S.; Cengage; 2017. ISBN 978-1285737027.
6. College Physics (2nd edition), Paul Peter Urone, Roger Hinrichs. Openstax; ISBN 978-1-951693-60-2.

Course Requirements and Instructional Methods

1. **"Success is the only option, so apply yourself diligently, strive for excellence, study hard, and always give your best effort!"**
2. **Out of Class Assignments:** The Department of Education policy states that one (1) credit hour is the amount of student work that reasonably approximates not less than one hour of class time and two (2) hours of out-of-class time per week over the span of a semester. WASC has adopted a similar requirement.
3. **Minimum requirements to access assignments in Canvas:**
 - a. Access to a computer,
 - b. Internet access (consider accessing the internet at alternative locations like IVC or the public library if you don't have it at home),
 - c. Browser: opt for Google Chrome or Firefox as your browser choice, as Safari may not display certain content correctly.

4. **Lab Experiments and Reports Guidelines:**

- Lab experiments will be conducted during class. Following each experiment, full lab reports must be submitted. Include:
 - Objective,
 - Summary,
 - Materials,
 - Procedure,
 - Data table,
 - Graphs,
 - Response to questions,
 - Conclusion.
 - Ensure that your lab reports are typed, utilizing double-spacing, and adhering to a font like Times New Roman, size 12 or similar.
 - Graphs should be created using Excel or another graphing program. Please refrain from submitting hand-drawn graphs.
 - Submit a hard copy of your report(s) within a week from the date of the experiment. Strictly adhere to this timeline; late submissions will not be accepted under any circumstances.
 - Please ensure you arrive on time for laboratory experiments, as we cannot delay the start until all students are present. If you are late, you may not be allowed to participate in the experiment.
 - Please note that only one make-up opportunity is allowed, covering a maximum of two labs. This policy is necessary due to room availability, time constraints, and staffing limitations.
 - If you are absent on the day of the experiment, kindly refrain from including your name in the lab report.
 - You can write a group report, but all students must contribute, and you will all receive the same grade. Alternatively, you can choose to submit an individual lab report.
5. **Lecture:** You need to read the chapters or modules because assignments are aligned with these readings. You can use any textbook or watch any videos of your choice as alternatives.
6. **Online Discussions:** As part of the course requirements, you need to answer the online discussions found in Canvas, under the “Discussions” tab.
7. **Online Quizzes:** At the end of each chapter, you will take a quiz to check your knowledge. Please refer to specific instructions under the “Quizzes” tab in Canvas.
8. **Computer Simulations:** To enhance your knowledge, you will have to run computer simulations (done via Canvas).
9. **Problems and Questions:** For each module, you will be required to complete problems and answer questions through Canvas. This practice will help you gain additional knowledge and prepare more effectively for exams.
10. **Tests or Exams:** They may be T/F, multiple choice, open-ended, and free response questions (done in class).
11. **Mid-term:** It may include questions from the first exam (recycled questions) and new questions (you have not seen them before but with similar level of difficulty). No makeup! (done in class).
12. **Final Exam:** It may include questions from the tests (recycled questions) and new questions (you have not seen them before but with similar level of difficulty). The MC section will include ALL chapters. No makeup! (done in class).

13. Students who are absent bear responsibility for both in-class activities and Canvas assignments.
14. **Assignment Deadlines:** You have an entire week to complete the assignments, so it is your responsibility to submit them on time. It is strongly recommended that you do not wait until Sunday at 11:30 PM to begin uploading your work, as you may encounter internet issues.
15. **Students may only request exam or assignment makeup if they provide valid documentation, such as hospitalization records, and promptly inform the instructor via email to coordinate arrangements.**

Course Grading Based on Course Objectives

The student's grade will depend on the following areas (not on total points):

➤ Laboratory Experiments	25%
➤ Discussions / Quizzes / Simulations	25%
➤ Exams (2)	20%
➤ Mid-term / Final Exam	30%
TOTAL	100%

All grades are calculated by using the standard scale of:

A = 100-90% B = 89.99-80% C = 79.99-70% D = 69.99-60% F = 59.99 % and below.

- **Grades are displayed in Canvas, and you must earn at least a "C" to pass the class.**
- **Final grades are not rounded under any circumstances, so please refrain from asking for adjustments if your grade is close to the next higher grade.**

Academic Honesty (Artificial Intelligence -AI)

IVC values critical thinking and communication skills and considers academic integrity essential to learning. Using AI tools as a replacement for your own thinking, writing, or quantitative reasoning goes against both our mission and academic honesty policy and will be considered academic dishonesty, or plagiarism unless you have been instructed to do so by your instructor. In case of any uncertainty regarding the ethical use of AI tools, students are encouraged to reach out to their instructors for clarification.

Accessibility Statement

Imperial Valley College is committed to providing an accessible learning experience for all students, regardless of course modality. Every effort has been made to ensure that this course complies with all state and federal accessibility regulations, including Section 508 of the Rehabilitation Act, the Americans with Disabilities Act (ADA), and Title 5 of the California Code of Regulations. However, if you encounter any content that is not accessible, please contact your instructor or the area dean for assistance. If you have specific accommodations through **DSPS**, contact them for additional assistance.

We are here to support you and ensure that you have equal access to all course materials.

Course Policies

ATTENDANCE

- A student who fails to attend the first meeting of a class or does not complete the first mandatory activity of an online class will be dropped by the instructor as of the first official meeting of that class. Should readmission be desired, the student's status

will be the same as that of any other student who desires to add a class. It is the student's responsibility to drop or officially withdraw from the class. See [General Catalog](#) for details.

- Regular attendance in all classes is expected of all students. A student whose continuous, unexcused absence exceed the number of hours the class is scheduled to meet per week may be dropped. For online courses, students who fail to complete required activities for two consecutive weeks may be considered to have excessive absences and may be dropped.
- Absences attributed to the representation of the college at officially approved events (conferences, contests, and field trips) will be counted as 'excused' absences.

CLASSROOM ETIQUETTE

- Electronic Devices: Cell phones and electronic devices must be turned off and put away during class, unless otherwise directed by the instructor.
- Food and Drink are prohibited in all classrooms. Water bottles with lids/caps are the only exception. Additional restrictions will apply in labs. Please comply as directed by the instructor.
- Disruptive Students: Students who disrupt or interfere with a class may be sent out of the room and told to meet with the Campus Disciplinary Officer before returning to continue with coursework. Disciplinary procedures will be followed as outlined in the [General Catalog](#).
- Children in the classroom: Due to college rules and state laws, no one who is not enrolled in the class may attend, including children.

ONLINE NETIQUETTE

- What is netiquette? Netiquette is internet manners, online etiquette, and digital etiquette all rolled into one word. Basically, netiquette is a set of rules for behaving properly online.
- Students are to comply with the following rules of netiquette: (1) identify yourself, (2) include a subject line, (3) avoid sarcasm, (4) respect others' opinions and privacy, (5) acknowledge and return messages promptly, (6) copy with caution, (7) do not spam or junk mail, (8) be concise, (9) use appropriate language, (10) use appropriate emoticons (emotional icons) to help convey meaning, and (11) use appropriate intensifiers to help convey meaning [do not use ALL CAPS or multiple exclamation marks (!!!!)].

ACADEMIC HONESTY

Academic honesty in the advancement of knowledge requires that all students and instructors respect the integrity of one another's work and recognize the important of acknowledging and safeguarding intellectual property.

There are many different forms of academic dishonesty. The following kinds of honesty violations and their definitions are not meant to be exhaustive. Rather, they are intended to serve as examples of unacceptable academic conduct.

PLAGIARISM

- Plagiarism is taking and presenting as one's own the writings or ideas of others, without citing the source. You should understand the concept of plagiarism and keep it in mind when taking exams and preparing written materials. If you do not understand how to "cite a source" correctly, you must ask for help.
- Cheating is defined as fraud, deceit, or dishonesty in an academic assignment, or using or attempting to use materials, or assisting others in using materials that are prohibited or inappropriate in the context of the academic assignment in question.

Anyone caught cheating or plagiarizing will receive a zero (0) on the exam or assignment, and the instructor may report the incident to the Campus Disciplinary Officer, who may place related documentation in a file. Repeated acts of cheating may result in an F in the course and/or disciplinary action. Please refer to the [General Catalog](#) for more information on academic dishonesty or other misconduct. Acts of cheating include, but are not limited to, the following: (a) plagiarism; (b) copying or attempting to copy from others during an examination or on an assignment; (c) communicating test information with another person during an examination; (d) allowing others to do an assignment or portion of an assignment; (e) using a commercial term paper service.

Other Course Information

Imperial Valley College offers various services in support of student success. The following are some of the services available for students. Please speak to your instructor about additional services which may be available.

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- CANVAS LMS. Canvas is Imperial Valley College's main Learning Management System. To log onto Canvas, use this link: [Canvas Student Login](#). The [Canvas Student Guides Site](#) provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- [Learning Services](#). There are several learning labs on campus to assist students through the use of computers and tutors. Please consult your [Campus Map](#) for the [Math Lab](#); [Reading, Writing & Language Labs](#); and the [Study Skills Center](#).
- [Library Services](#). There is more to our library than just books. You have access to tutors in the [Study Skills Center](#), study rooms for small groups, and online access to a wealth of resources.
- CANVAS LMS. Canvas is Imperial Valley College's Learning Management System. To log onto Canvas, use this link: [Canvas Student Login](#). The [Canvas Student Guides Site](#) provides a variety of support available to students 24 hours per day. Additionally, a 24/7 Canvas Support Hotline is available for students to use: 877-893-9853.
- Any student with a documented disability who may need educational accommodations should notify the instructor or the [Disabled Student Programs and Services](#) (DSP&S) office as soon as possible. The DSP&S office is located in Building 2100, telephone 760-355-6313. Please contact them if you feel you need to be evaluated for educational accommodations.

IVC Student Resources

IVC wants you to be successful in all aspects of your education. For help, resources, services, and an explanation of policies, visit <http://www.imperial.edu/studentresources> or click the heart icon in Canvas.

Financial Aid

Your Grades Matter! To continue to receive financial aid, you must meet the Satisfactory Academic Progress (SAP) requirement. Making SAP means that you are maintaining a 2.0 GPA, you have successfully completed 67% of your coursework, and you will graduate on time. If you do not maintain SAP, you may lose your financial aid. If you have questions, please contact financial aid at finaid@imperial.edu.

Anticipated Class Schedule/Calendar

*****Subject to change without prior notice*****

WEEK OF	ACTIVITY, ASSIGNMENT, TOPIC	CONTENT	ASSIGNMENT DUE
Week 1 February 10-16	Syllabus / Assignments/Canvas Module 0: Meet and Greet MODULE 1: Electric charge and electric field (Part A)	A. Static Electricity and Charge: Conservation of Charge B. Coulomb's Law C. Electric field	<i>Refer to Canvas for due dates</i>
Week 2 February 17-23 Monday 2/17 is a holiday	MODULE 1: Electric charge and electric field (Part B)	A. Electric potential energy and electric potential B. Capacitance, dielectrics, dipoles C. Capacitors in series and parallel D. Energy stored in capacitors	
Week 3 February 24- March 02		A. Current and Resistance B. Ohm's law C. Electric power and energy	<i>Refer to Canvas for due dates</i>



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	MODULE 2: Electric Current, Resistance, Ohm's Law, and DC circuits	<ul style="list-style-type: none"> D. Kirchhoff's rules E. DC circuits F. Meters G. RC circuits 	
<p>Week 4 March 03-09</p>	MODULE 3: Magnetism	<ul style="list-style-type: none"> A. Magnetic field and magnetic force B. Force on a moving charge in a magnetic field C. The Hall effect D. Torque on a current loop: motors and meters E. Biot-Savart Law F. Ampere's Law 	<i>Refer to Canvas for due dates</i>
<p>Week 5 March 10-16</p>	MODULE 4: Electromagnetic induction	<ul style="list-style-type: none"> A. Faraday's Law of induction B. Lenz's Law C. Motional EMF D. Eddy currents and magnetic damping E. Inductance and RL circuits F. Reactance and RLC circuits 	<i>Refer to Canvas for due dates</i>
<p>Week 6 March 17-23</p>	Exam # 1 (Modules 1-4)		Done in Class
<p>Week 7 March 24-30</p>	MODULE 5: Electromagnetic (EM) waves	<ul style="list-style-type: none"> A. Maxwell's equations B. Production of EM waves C. EM spectrum D. Energy in EM waves 	<i>Refer to Canvas for due dates</i>
<p>Week 8 March 31-April 06</p>	MODULE 6: Geometric Optics	<ul style="list-style-type: none"> A. The ray aspect of light B. The laws of reflection and refraction C. Total internal reflection D. Dispersion, rainbows and prisms E. Image formation by lenses and mirrors F. The physics of the eye G. Optical instruments: Microscopes, telescopes, and aberrations 	<i>Refer to Canvas for due dates</i>
<p>Week 9 April 7-13</p>	MODULE 7: Wave Optics	<ul style="list-style-type: none"> A. Interference 	

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		<ul style="list-style-type: none"> B. Huygens's principle and diffraction C. Young's double slit experiment D. Single and multiple slit diffraction E. Limits of resolution and the Rayleigh criterion F. Thin film interference G. Polarization 	<i>Refer to Canvas for due dates</i>
<p>Week 10 April 14-20</p>	<p>MODULE 8: Special Relativity</p>	<ul style="list-style-type: none"> A. Einstein's postulates B. Simultaneity and time dilation C. Length contraction D. Relativistic momentum and energy 	<i>Refer to Canvas for due dates</i>
<p>April 21-27</p>	<p>SPRING BREAK</p>	<p>NO CLASS</p>	<p>-----</p>
<p>Week 11 April 28-May 04</p>	<p>Mid-term (Modules 1-7)</p>		<p>Done in Class</p>
<p>Week 12 May 05-11</p>	<p>MODULE 9: Quantum Physics</p>	<ul style="list-style-type: none"> A. Quantization of energy B. The photoelectric effect C. Photon energies and momentum D. The particle-wave duality E. The wave nature of matter F. The Heisenberg uncertainty principle 	<i>Refer to Canvas for due dates</i>
<p>Week 13 May 12-18</p>	<p>MODULE 10: Atomic Physics</p>	<ul style="list-style-type: none"> A. Discovery of the atom and parts of the atom (electrons and nuclei) B. Bohr's theory of the hydrogen atom C. X-rays D. Patterns in spectra and quantization E. The Pauli exclusion principle 	<i>Refer to Canvas for due dates</i>
<p>Week 14 May 19-25</p>	<p>Exam # 2 (Modules 8-10)</p> <p>MODULE 11: Radioactivity and Nuclear Physics</p>	<ul style="list-style-type: none"> A. Nuclear radioactivity B. Nuclear decay and conservation laws C. Half-life and activity D. Binding energy and tunneling E. Fission and fusion 	<p>Done in Class</p> <p><i>Refer to Canvas for due dates</i></p>



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		F. Medical applications of nuclear physics	
Week 15 May 26-June 01 Monday 05/26 is a holiday	MODULE 12: Particle Physics	A. The Yukawa particle and the Heisenberg uncertainty principle revisited B. The four basic forces C. Particles, patterns and conservation laws D. Quarks	<i>Refer to Canvas for due dates</i>
Week 16 June 02-06	Final Exam (All Modules)		Done in Class