UNIVERSITY of VIRGINIA

UVA IN VALENCIA PROGRAM

PHYS 2010 – PRINCIPLES OF PHYSICS 1 GENERAL PHYSICS I

FOR PRE-HEALTH STUDENTS

I. COURSE DESCRIPTION

Physics 2010 constitute a course sequence covering the principles of Mechanics, rotational dynamics, properties of matter, heat, wave motion, and sound. A working knowledge of arithmetic, elementary algebra, and trigonometry is essential.

II. GRADING SCALE AND BREAKDOWN

Grades will be awarded according to the **Uva grading scale**:

A 10-9 **A-** 8,9-8	**B+** 7,9-7 **B** 6,9-6 **B-** 5,9-5,5	**C** 5,4-5	**F** 4,9-0

Grade Breakdown

Quizzes	20%
Midterm exam	25%
Final exam	40%
Participation	15%

Quizzes (20%)

Students will have the opportunity to assess their learning progress through quizzes. These will be administered during class three or four times throughout the course. The quizzes will generally consist of 10 to 15 questions: True or false questions, multiple-choice questions, definitions, questions about concepts, some simple numerical calculations or problems, etc. The final quiz grade will be the average of the scores obtained on the quizzes.

Midterm exam (25%)

This exam will cover the material studied from the beginning of the course up to the week prior. Only topics covered during the course will be included. The exam will consist of several exercises and numerical calculation problems,

similar to those seen in class. More information will be provided during the last week of classes before the midterm exam.

Final exam (40%)

This exam will cover the entire course. Only topics covered during the course will be included. The exam will consist of several numerical calculation exercises and problems, similar to those discussed in class. Further information will be provided during the last week of classes before the final exam.

Participation (15%)

Students are expected to comply with the assigned work plan on a daily basis. Coming prepared to class is essential to the learning process. The following rubric is important regarding participation grades:

A The student always prepares the class and complies with the work plan assigned daily; he/she participates voluntarily and frequently, works well as a team, and contributes positively to the classroom environment.

B The student participates voluntarily and frequently by answering questions from the instructor.

C The student participates sporadically when the teacher asks and he/she/they occasionally asks questions.

D The student does not make effort to participate or minimum work is done.

F The student is absent and shows disrespect to other peers and to the professor.

III. BIBLIOGRAPHY AND MATERIALS

The reference textbook we will use is College Physics: A Strategic Approach, Knight, Jones & Field, Pearson Education, 4th edition.

IV. COURSE PLANNING AND CALENDAR

(Please note that this could change as the semester progresses)

DATES	CONTENTS
9/8/2026	Part I. 1- Force and Motion. Representing Motion. Models and modeling. Velocity.
9/10/2026	A Sense of Scale. Scientific notation. Vectors and Motion.
9/15/2026	2- Motion in One Dimension. Describing motion. Uniform motion. Instantaneous velocity.
9/17/2026	Acceleration. Motion with Constant Acceleration. Solving One-Dimensional Motion Problems. Free Fall
9/22/2026	Review/Problems.
9/24/2026	3- Vectors and Motion. in Two Dimensions. Using Vectors. Coordinate Systems and Vector Components. Motion on a Ramp. Motion in Two Dimensions.
9/29/2026	Projectile Motion. Projectile Motion: Solving Problems. Circular Motion. Relative Motion.
10/01/2026	Review/Problems.
10/06/2026	4- Forces and Newton's Laws of Motion. Motion and Forces. A Short Catalong of Forces. Identifying Forces. What Do Forces Do?
10/08/2026	Newton's Second Law. Free-Body Diagrams. Newton's Third Law.
10/20/2026	5- Applying Newton's Laws. Equilibrium. Dynamics and Newton's Second Law. Mass and Weight. Normal Forces. Friction. Drag

10/22/2026	**Review/Problems. Quiz 1**
10/27/2026	**6- Circular Motion, Orbits, and Gravity. Uniform Circular Motion. Dynamics of Uniform Circular Motion. Apparent Forces in Circular Motion. Newton's Law of Gravity**
10/29/2026	**MIDTERM EXAM**
11/03/2026	**7- Rotational Motion. Describing Circular and Rotational Motion. The Rotation of a Rigid Body.**
11/05/2026	**Torque. Gravitational Torque and the Center of Gravity. Rotational Dynamics and Moment of Inertia. 8- Equilibrium and Elasticity. Torque and Static Equilibrium. Stability and Balance. Springs and Hooke's Law. Stretching and Compressing Materials.**
11/10/2026	**Review/Problems. Quiz 2**
11/12/2026	**Part II. 9- Momentum. Impulse. Momentum and the Impulse-Momentum Theorem. Solving Impulse and Momentum Problems. Conservation of Momentum. Inelastic Collisions. Angular Momentum.**
11/17/2026	**10- Energy and Work. The Basic Energy Model. Work. Kinetic Energy. Potential Energy. Thermal Energy. Conservation of Energy.**
11/19/2026	**Energy Diagrams. Molecular Bonds and Chemical Energy. Energy in Collisions. Power.**
11/24/2026	**11- Using Energy. Transforming Energy. Energy in the Body. Temperature, Thermal Energy, and Heat. The First Law of Thermodynamics.**
11/26/2026	**Review/Problems. Quiz 3**
12/01/2026	**Part III. 12- Thermal Properties of Matter. The Atomic Model of Matter. The Atomic Model of an Ideal Gas.**
12/03/2026	**Part IV. 14- Oscillations. Equilibrium and Oscillation. Linear Restoring Forces and SHM. Describing Simple Harmonic Motion. Energy in Simple Harmonic Motion. Pendulum Motion.**
12/10/2026	**15- Traveling Waves and Sound. The Wave Model. Traveling Waves. Graphical and Mathematical Descriptions of Waves. Sound and Light Waves. Energy and Intensity. Loudness of Sound. The Doppler Effect and Shock Waves.**
12/11/2026	**Review/Problems. Quiz 4**
12/14-15-16/2026	**FINAL EXAM (oficial schedule)**

IMPORTANT INFORMATION

1) Use of Spanish at the Center

The use of Spanish at the Center is strongly encouraged. Remember that you have come to Spain to learn Spanish and immerse yourself in its culture, and there is no better way to do so than by using Spanish on as many occasions as possible.

2) Class Attendance and Tardiness

2.1) Attendance and punctuality are essential for the successful completion of the course. Consequently, unexcused absences and lateness will negatively affect the final grade.

2.2) Only one unexcused absence is permitted. Please bear this in mind when planning trips or outings.

2.3) Arriving more than 5 minutes late to class will count as half an absence (1/2). It is the student's responsibility to notify the instructor of an absence before the class begins.

2.4) Arriving more than 30 minutes late to class will be considered an absence.

2.5) Four (4) unexcused absences will result in the student not receiving credit for the course.

2.6) Only documented absences will be considered excused: a religious holiday, a family emergency, or a medical appointment. Medical absences must be supported by a doctor's note and submitted at reception on the day the student returns to class after the incident has ended.

3) Academic Integrity

3.1) The exchange of information is not only permitted but is also a way of enriching the knowledge acquired during the course. However, all work submitted for each course must be individual and original in every respect. Any sources and direct quotations used must be properly cited.

3.2) Remember that the use of artificial intelligence to complete assignments or examinations is strictly prohibited unless an instructor expressly states otherwise. Such use constitutes a lack of authenticity, and may amount to direct plagiarism, in addition to undermining the development of critical thinking and writing skills, which are among the primary goals of this program. Failure to comply with this rule will result in a grade of "F" for the course.

3.3) Any work that has received credit for one course will NOT be accepted for credit in another course. There will be NO exceptions to this rule. Reusing such work will result in immediate failure of the second course. If assignments for two different courses are related in any way and the student has questions about whether the second project is permissible, the matter must be discussed with all instructors involved. This will prevent any possible unintentional violation of this rule.

3.4) As with punctuality, assignments must be submitted on time. Any late submission will result in a reduction of the grade for that assignment.

3.5) Failure to comply with the provisions set out above will result in the loss of the corresponding course credits for the course in which these rules have been violated.

3.6) If you have a documented special need that requires academic accommodations (SDAC), it must be certified by your home institution. Please contact the Head of Studies in Valencia, María Andrés (maria.andres@uvavalencia.org).

4) Activities, Workshops, and Lectures

Throughout the course, various activities, workshops, and lectures are organized. Participation may be voluntary or mandatory if the instructor considers the activity relevant to the course.

5) Classroom Conduct

5.1) It is very important that all students arrive to class on time, prepared, and with the materials needed for the day. During class, students must treat one another and the instructor with respect, demonstrate a positive attitude, and help create a participatory and collaborative environment that supports effective learning. Any violation of these expectations will have direct consequences.

5.2) Electronic devices (laptop, mobile phone, smartwatch) may be used in class only for course-related purposes. If a student uses such technology for personal reasons during class, the student may be penalized with an unexcused absence.

5.3) The use of computer or electronic technology during examinations is prohibited unless the instructor determines otherwise in accordance with the examination format.

6) Course Content

On occasion, and always within the context of the course, certain "sensitive" topics may be addressed both inside and outside the classroom. Therefore, if a student feels offended by such content in a particular class, the student may leave the class, and doing so will not have any negative effect whatsoever on the final grade. Faculty members will always be open to communication and dialogue in order to promote better intercultural understanding.

7) Final Clarification

The instructor may modify or add activities and/or change the dates indicated according to the learning needs of the group. Effective learning requires not only careful planning, but also a certain degree of flexibility.