



INSTRUCTIONAL PACKAGE

PHY 201
Physics I

Effective Term
Fall 2024/Spring 2025/Summer 2025

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Part I: Course Information

Effective Term: Fall 2024/Spring 2025/Summer 2025

COURSE PREFIX: PHY 201 COURSE TITLE: Physics I

CONTACT HOURS: 3-3 CREDIT HOURS: 4

RATIONALE FOR THE COURSE:

Completion of PHY 201 enables the student to gain an appreciation and working knowledge of fundamental principles in the area of physics. These concepts are approached through the development of problem-solving skills, which helps prepare students for future careers in science fields. Additionally, this course is designed to satisfy freshman-level physics requirements at other colleges.

COURSE DESCRIPTION:

This is the first in a sequence of physics courses. Topics include mechanics, wave motion, sound, heat, electromagnetism, optics, and modern physics. This course is transferable to public senior institutions as part of the South Carolina Commission on Higher Education Statewide Articulation Agreement.

PREREQUISITES/CO-REQUISITES:

(Credit level [MAT 110](#) Minimum Grade of C or Credit level [MAT 110](#) Minimum Grade of TC or Credit level [MAT 111](#) Minimum Grade of C or Credit level [MAT 111](#) Minimum Grade of TC or Credit level [MAT 175](#) Minimum Grade of C or Credit level [MAT 175](#) Minimum Grade of TC or Credit level [MAT 176](#) Minimum Grade of C or Credit level [MAT 176](#) Minimum Grade of TC) or (Multiple Measures Math 1) or (ACT Math 26 or New SAT Mathematics 650 or SAT Mathematics 630 or New ACCUPLACER Adv Algebra 270)

***Online/Hybrid** courses require students to complete the [Distance Learning Orientation Video](#) prior to enrolling in an online course.

REQUIRED MATERIALS:

Please visit the [BOOKSTORE](#) online site for most current textbook information.

Enter the semester, course prefix, number and section when prompted and you will be linked to the correct textbook.

ADDITIONAL REQUIREMENTS:

A scientific calculator and graph paper.

For Hybrid/Online Students Only: Each student will be required to view an orientation PowerPoint presentation during the first week of class. This presentation can be found on the course homepage in D2L under News. After viewing the presentation, all online students must complete the orientation quiz, which can be found under the dropdown assignment menu. A student will not be considered officially enrolled in the course until the presentation has been viewed and the quiz completed with a 100% score. Any submitted work from the student including discussion posts, assignments, etc. will not be given a grade until the presentation has been viewed and the quiz has been submitted. Failure to view the presentation and take the quiz before midnight on the last day to add/drop classes will result in the student being automatically dropped from the course.

TECHNICAL REQUIREMENTS:

Access to Desire2Learn (D2L), HGTC's learning management system (LMS) used for course materials.

Access to myHGTC portal for student self-services.

College email access – this is the college's primary official form of communication.

STUDENT IDENTIFICATION VERIFICATION:

Students enrolled in online courses will be required to participate in a minimum of one (1) proctored assignment and/or one (1) virtual event to support student identification verification. Please refer to your Instructor Information Sheet for information regarding this requirement.

CLASSROOM ETIQUETTE:

As a matter of courtesy to other students and your professor, please turn off cell phones and other communication/entertainment devices before class begins. If you are monitoring for an emergency, please notify your professor prior to class and switch cell phone ringers to vibrate.

NETIQUETTE: is the term commonly used to refer to conventions adopted by Internet users on the web, mailing lists, public forums, and in live chat focused on online communications etiquette. For more information regarding Netiquette expectations for distance learning courses, please visit [Online Netiquette](#).

ACADEMIC DISHONESTY:

All forms of academic dishonesty, as outlined in the Student Code in the HGTC catalog, will NOT be tolerated and will result in disciplinary action. Anyone caught cheating (Defined in the code as: "a. Copying from another student's test or answer sheet. b. Using materials or equipment during a test not authorized by the person giving the test. c. Collaborating with any other person during a test without permission. d. Knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part the contents of a test prior to its administration. e. Bribing or coercing any other person to obtain tests or information about tests. f. Substituting for another student or permitting any other person to substitute for oneself. g. Cooperating or aiding in any of the above.") or committing plagiarism (Defined in the code

as: "(1) the appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work or (2) submitting content for academic purposes that are created by artificial intelligence, technology platforms, or writing services and representing that such content is the person's own work product.") will be given a grade of a zero for that assignment and reported to the Senior VP of Academic Affairs, in accordance with the student handbook. A second offense will result in the student being withdrawn from the course with a W or WF at the professor's discretion and charges being filed with the Chief Student Services Officer.

Part II: Student Learning Outcomes

COURSE LEARNING OUTCOMES and ASSESSMENTS*:

A student will demonstrate an understanding of Scientific Measurement by:

- utilizing the metric system of measurement.
- listing the standards used for length, mass, time and temperature.
- utilizing scientific notation.
- interpreting the prefixes (such as k-, m-, M-, μ -) used in describing quantities.
- relating all units associated with dimensions.
- defining and demonstrating the use of significant figures.
- demonstrating the ability to interconvert among various units of measure.
- identifying and applying all mathematical notations used in this class.
- demonstrating knowledge of each type of coordinate system discussed in class by converting from one to the other.

A student will demonstrate an understanding of the Use of Vectors by:

- distinguishing between scalars and vectors.
- demonstrating the ability to add and subtract vectors.
- dividing a vector into its two component vectors.
- combining two component vectors into its resultant vector, with magnitude and direction expressed.

A student will demonstrate an understanding of Motion in One Direction by:

- distinguishing between displacement and distance.
- determining average and instantaneous velocities, average and instantaneous accelerations.
- solving for unknown variables in the equations for motion in a straight line under constant acceleration.
- explaining the meaning of a freely falling object and solving the equation for free fall motion for any unknown quantity.

A student will demonstrate an understanding of Two-Dimensional Motion by:

- explaining what is meant by projectile motion and calculating all quantities associated with projectile motion.
- explaining what is meant by relative velocity.

A student will demonstrate an understanding of the Laws of Motion by:

explaining what is meant by contact and field forces.
identifying the applications of Newton's three laws of motion.
explaining the difference between mass and inertia.
utilizing Newton's second law of motion in calculations for any unknown quantity.
explaining the similarity between weight and gravitational force.
assessing the conditions for equilibrium to determine whether or not equilibrium exists.
explaining the two types of friction and the conditions under which each exists.
explaining how friction works and being able to calculate the quantity of force due to friction.
utilizing friction in situations where accelerations occur to determine the motion of objects.

A student will demonstrate an understanding of Circular Motion and the Law of Gravity by:

solving for angular displacement, angular velocity and angular acceleration when given appropriate information.
solving the equations of rotational motion for any unknown quantity.
determining linear quantities from angular quantities when given appropriate information.
calculating centripetal acceleration and force and explaining how they are requirements for any object undergoing circular motion.
calculating total acceleration for any object undergoing centripetal and linear acceleration simultaneously.
explaining how other forces can provide the centripetal forces necessary for circular motion.
determining the gravitational force between any two objects of any mass and separation distance.
determining the gravitational potential energy of an object.
interpreting angular quantities in terms of vectors.

A student will demonstrate an understanding of Work and Energy by:

discussing the technical definitions of work and energy.
calculating work done in various situations.
explaining the concept of potential energy and kinetic energy.
explaining the work-kinetic energy theorem.
explaining the meaning of conservative and non-conservative forces.
utilizing the conservation of mechanical energy in problems to solve for any unknown quantity.
applying the concept of elastic potential energy to problems involving springs.
calculating power in any of the units used in class.

A student will demonstrate an understanding of Momentum and Collisions by:

explaining the meaning of momentum and expressing it in the correct units.
demonstrating the ability to break momentum into its components.
applying the momentum-impulse equation and explaining its relation to Newton's second law.
applying conservation of momentum in collisions of two or more objects in two dimensions to solve for any unknown quantity.
explaining the three different types of collisions and stating what is conserved in each type.

A student will demonstrate an understanding of Rotational Equilibrium and Rotational Dynamics by:

calculating torque when given a force and the lever arm distance at which it is applied.
applying the second condition for equilibrium as it applies to torque and forces.
explaining the concept of center of gravity and calculating it for simple homogeneous, symmetric bodies.
explaining the concept of moment of inertia and calculating its value for objects of various shape and mass.
utilizing the relationship between net torque and angular acceleration to solve for any unknown quantity.
defining angular momentum and calculating it from the characteristics of a moving object.
explaining the concept of conservation of angular momentum and how the total angular momentum will stay the same until an outside torque changes its total value.

A student will demonstrate an understanding of Simple Harmonic Motion and Elasticity by:

applying Hooke's law to solve for any unknown quantity associated with a spring.
explaining what is meant by simple harmonic motion and recognizing all terms associated with simple harmonic motion.
determining acceleration and velocity for a particle undergoing simple harmonic motion.
determining the elastic potential energy stored in a spring and using the elastic potential energy equation to solve for any unknown quantity.
determining the total mechanical energy of a system involving a spring or a pendulum and applying conservation of energy to solve for any unknown quantity in either case.
determining the frequency, amplitude and wavelength for a wave when given appropriate information.
explaining what is meant by stress and strain, Young's modulus, shear modulus, bulk modulus and the stress-strain curve for a solid.

A student will demonstrate an understanding of Fluids by:

calculating the density of a material and the pressure under a fluid with the appropriate units.
explaining the meaning of specific gravity.
explaining the difference between the pressure measurements discussed in class.
explaining Archimedes' principle in general and determining the weight of objects immersed in a fluid.
explaining what is required for objects to sink, float or remain suspended in a fluid.
applying the equation of continuity to solve for any unknown quantity.
explaining Bernoulli's equation in terms of conservation of energy.
applying Bernoulli's equation to solve for any unknown quantity.
explaining the concepts of surface tension, capillary action and viscosity.
explaining the concept of transport phenomena and diffusion.

A student will demonstrate an understanding of Thermal Physics by:

explaining the difference between temperature and thermal energy.
solving conversion calculations among Celsius, Kelvin and Fahrenheit temperature scales.
explaining what is meant by the triple point of water.
explaining what is meant by absolute zero and expressing that quantity in all temperature scales.

determining the amount of expansion, area change, or volume change undergone by solids and liquids through a temperature change.

applying the equation of state for an ideal gas.

defining the ideal gas law and using it to solve for any unknown quantity.

defining the kinetic theory of gases.

A student will demonstrate an understanding of Heat by:

explaining the concept of heat as a quantity of energy and converting quantities of heat into quantities of energy.

calculating the amount of heat energy required to change the temperature of a substance by a given number of degrees.

explaining what is meant by specific heat.

explaining what is meant by latent heat.

explaining how heat is transferred by conduction, convection and thermal conductivity and calculating the amount of heat energy transferred in each case.

A student will demonstrate an understanding of the basic behavior of Sound Waves by:

explaining the difference between the different types of waves discussed in class.

categorizing a sound as infrasonic, audible or ultrasonic.

calculating the speed of sound through a liquid or a solid rod.

calculating the temperature dependent speed of sound through air.

calculating the intensity of a sound wave when given the power produced and converting that intensity into a decibel level.

calculating the intensity at a second distance when given a sound intensity at one distance

applying the Doppler effect to determine the apparent frequency heard for a variety of moving sound sources or sound observers.

A student will demonstrate an understanding of the complex behavior of Sound Waves by:

determining the appearance of waves having undergone superpositioning or interference.

explaining what is meant by constructive or destructive interference.

calculating characteristics of standing waves (harmonics, overtones) such as frequency, wavelength or length.

explaining the concepts of forced vibration and resonance.

calculating the fundamental frequencies for standing waves in air column, closed pipes and open pipes.

explaining the concept of beats in sound waves.

explaining what is meant by the quality of sound.

****Students – please refer to the Instructor’s Course Information sheet for specific information on assessments and due dates.***

Part III: Grading and Assessment

EVALUATION OF REQUIRED COURSE MEASURES/ARTIFACTS*

Students' performance will be assessed and the weight associated with the various measures/artifacts are listed below.

EVALUATION*

Lecture	75%
Lab	25%
Total	100%

****Students, for the specific number and type of evaluations, please refer to the Instructor's Course Information Sheet.***

GRADING SYSTEM:

Please note the College adheres to a 10-point grading scale A = 100 – 90, B = 89- 80, C = 79 – 70, D = 69 – 60, F = 59 and below.

Grades earned in courses impact academic progression and financial aid status. Before withdrawing from a course, be sure to talk with your instructor and financial aid counselor about the implications of that course of action. Ds, Fs, Ws, WFs and Is also negatively impact academic progression and financial aid status.

The Add/Drop Period is the first 5 days of the semester for **full term** classes. Add/Drop periods are shorter for accelerated format courses. Please refer to the [academic calendar](#) for deadlines for add/drop. You must attend at least one meeting of all of your classes during that period. If you do not, you will be dropped from the course(s) and your Financial Aid will be reduced accordingly.

Part IV: Attendance

Horry-Georgetown Technical College maintains a general attendance policy requiring students to be present for a minimum of 80 percent (80%) of their classes in order to receive credit for any course. Due to the varied nature of courses taught at the college, some faculty may require up to 90 percent (90%) attendance. Pursuant to 34 Code of Federal Regulations 228.22 - Return to Title IV Funds, once a student has missed over 20% of the course or has missed two (2) consecutive weeks, the faculty is obligated to withdraw the student and a student may not be permitted to reenroll. **Instructors define absentee limits for their class at the beginning of each term; please refer to the Instructor Course Information Sheet.**

For online and hybrid courses, check your Instructor's Course Information Sheet for any required on-site meeting times. Please note, instructors may require tests to be taken at approved testing sites, and if you use a testing center other than those provided by HGTC, the center may charge a fee for its services.

Science Department Attendance Policies

For a 15-week course (fall and spring) or a 10-week course (summer), the allowed number of absences for a MW or TR class is as follows: 4 absences are allowed for lecture and 2 are allowed for lab,

regardless of reason. For a lecture class that meets once a week, the allowed number of absences is 2.

For a 7-week fast-paced course (fall and spring) or a 5-week fast-paced course (summer), the allowed number of absences is as follows: 1 absence is allowed for lecture and 1 for lab, regardless of reason.

When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF. Remember, an absence is an absence, no matter if it is excused or not!

Online/Hybrid Attendance:

Students enrolled in distance learning courses (hybrid and online) are required to maintain contact with the instructor on a regular basis to be counted as "in attendance" for the course. All distance learning students must participate weekly in an Attendance activity in order to demonstrate course participation. Students showing no activity in the course for two weeks (these weeks do not need to be consecutive) will be withdrawn due to lack of attendance.

Lab Attendance for Hybrid Courses:

Students in hybrid classes in which labs meet weekly, are allowed two (2) lab absences. Students in hybrid labs that only meet 5 or 6 times during the semester, must attend all lab sessions for its entirety. When a student surpasses the allowed number of absences, the student will be dropped automatically from the course with a W or a WF.

Part V: Student Resources



THE STUDENT SUCCESS AND TUTORING CENTER (SSTC):

The SSTC offers to all students the following **free** resources:

1. **Academic tutors** for most subject areas, **Writing Center support**, and **college success skills**.
2. Online **tutoring** and academic support resources.
3. Professional and interpersonal communication **coaching** in the EPIC Labs.

Visit the [Student Success & Tutoring Center](#) website for more information. To schedule tutoring, contact the SSTC at ssc@hgtc.edu or self-schedule in the Penji iOS/Android app or at www.penjiapp.com. Email ssc@hgtc.edu or call SSTC Conway, 349-7872; SSTC Grand Strand, 477-2113; and SSTC Georgetown, 520-1455, or go to the [Online Resource Center](#) to access on-demand resources.



STUDENT INFORMATION CENTER: TECH Central

TECH Central offers to all students the following free resources:

1. **Getting around HGTC:** General information and guidance for enrollment, financial aid, registration, and payment plan support!
2. Use the [Online Resource Center \(ORC\)](#) including Office 365 support, password resets, and username information.
3. **In-person workshops, online tutorials and more services** are available in Desire2Learn, Student Portal, Degree Works, and Office 365.
4. **Chat with our staff on TECH Talk**, our live chat service. TECH Talk can be accessed on the student portal and on TECH Central's website, or by texting questions to (843) 375-8552.

Visit the [Tech Central](#) website for more information. Live Chat and Center locations are posted on the website. Or please call (843) 349 – TECH (8324), Option #1.



HGTC LIBRARY:

Each campus location has a library where HGTC students, faculty, and staff may check out materials with their HGTC ID. All three HGTC campus libraries are equipped with computers to support academic research and related schoolwork; printing is available as well. Visit the [Library](#) website for more information or call (843) 349-5268.

STUDENT TESTING:

Testing in an **online/hybrid** course and in **make-up exam** situations may be accomplished in a variety of ways:

- Test administered within D2L
- Test administered in writing on paper
- Test administered through Publisher Platforms which may have a fee associated with the usage)

Furthermore, tests may have time limits and/or require a proctor.

Proctoring can be accomplished either face-to-face at an approved site or online through our online proctoring service. To find out more about proctoring services, please visit the [Online Testing](#) section of the HGTC's Testing Center webpage.

The **Instructor Information Sheet** will have more details on test requirements for your course.

DISABILITY SERVICES:

HGTC is committed to providing an accessible environment for students with disabilities. Inquiries may be directed to HGTC's [Accessibility and Disability Service webpage](#). The Accessibility and Disability Services staff will review documentation of the student's disability and, in a confidential setting with the student, engage in an interactive process to develop an educational accommodation plan.

Note: It is the student's responsibility to self-identify as needing accommodations and to provide acceptable documentation. After a student has self-identified and submitted documentation of a disability, accommodations may be determined, accepted, and provided. Students will need to reach out to the Accessibility and Disability Services staff each semester to renew their accommodations.

COUNSELING SERVICES:

HGTC Counseling Services strives to optimize student success through managing personal and academic concerns that may interfere with achieving educational goals. Staff are available to every student for assistance and guidance on personal matters, academic concerns and other areas of concern. HGTC offers free in-person and telehealth counseling services to students. For more information about counseling services, please reach out to counseling@hgtc.edu or visit the website the [Counseling Services webpage](#).

STATEMENT OF EQUAL OPPORTUNITY/NON-DISCRIMINATION STATEMENT:

Horry-Georgetown Technical College shall not discriminate in employment or personnel decisions or in student admissions or in student decisions, or in all other segments of the College community on the basis of race, color, sex, national or ethnic origin, age, religion, disability, marital or family status, veteran status, political ideas, sexual orientation, gender identity, or pregnancy, childbirth, or related medical conditions, including, but not limited to, lactation, in the educational programs and activities which it operates, and the college is prohibited from discrimination in such manner by applicable laws. Practices and requirements for nondiscrimination extend to the enrollment of students in programs and activities of the College and employment by the College.

All inquiries regarding the federal laws as they relate to discrimination on the basis of sex may be directed to Tamatha Sells, Title IX Coordinator, Horry-Georgetown Technical College, Building 1100C, Room 107B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5218, tamatha.sells@hgtc.edu or to the US Department of Education Office of Civil Rights. (Telephone: 800-421-3481/Email: OCR@ed.gov).

Other employee and applicant inquiries concerning the federal laws and their application to the College may be directed to Jacquelyne Snyder, Vice President, Human Resources and Employee Relations & the College's Affirmative Action/Equal

Opportunity Officer, Horry-Georgetown Technical College, Building 200C, Room 205B, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5212, jacquelyne.snyder@hgtc.edu.

Other student and prospective student inquiries concerning the federal laws and their application to the College or any student decision may be directed to Dr. Melissa Batten, Vice President, Student Affairs, Section 504 & Title II Coordinator Horry-Georgetown Technical College, Building 1100C, Room 107A, 2050 Hwy 501 E, PO Box 261966, Conway, SC 29528-6066, 843-349-5228, melissa.batten@hgtc.edu.

TITLE IX REQUIREMENTS:

Title IX of the Education Amendments of 1972 protects students, employees, applicants for admission and employment, and other persons from all forms of sex discrimination.

HGTC prohibits the offenses of domestic violence, dating violence, sexual assault, and stalking and will provide students, faculty, and staff with necessary information regarding prevention, policies, procedures, and resources.

Any student, or other member of the college community, who believes that they have been a victim of sexual harassment, domestic violence, dating violence, sexual assault, or stalking may file a report with the college's Title IX Coordinator or campus law enforcement*.

*Faculty and Staff are required to report these incidents to the Title IX Coordinator when involving students. The only HGTC employees exempt from mandatory reporting are licensed mental health professionals (only as part of their job description such as counseling services).

For more information, contact Tamatha Sells, Title IX Coordinator, Conway Campus, Building 1100C, Room 107B, 843-349-5218, tamatha.sells@hgtc.edu.

PREGNANCY ACCOMMODATIONS

Under Title IX, colleges must not exclude a pregnant student from participating in any part of an educational program. Horry-Georgetown Technical College is committed to ensuring that pregnant students receive reasonable accommodations to ensure access to our educational programs.

Students should advise the Title IX Coordinator of a potential need for accommodations as soon as they know they are pregnant. It is extremely important that communication between student, instructors, and the Title IX Coordinator begin as soon as possible. Each situation is unique and will be addressed individually.

Title IX accommodations DO NOT apply to Financial Aid. Financial Aid regulations do not give the College any discretion in terms of Financial Aid eligibility.

Certain educational programs may have strict certification requirements or requirements mandated by outside regulatory agencies. Therefore, in some programs, the application of Title IX accommodations may be limited.

To request pregnancy accommodations, please complete the [Pregnancy Intake Form](#).