



University of  
**Pittsburgh**

College in the High School

**Bradford**

**Concepts of Modern Physics**  
**PHYS 0103**  
**3 credits**

**Description:** A basic examination of essential topics, including mechanics, properties of matter, heat, sound, electricity and magnetism, light, atomic and nuclear physics, relativity, and astrophysics.

**Prerequisite:** None

**Textbook:** The recommended text for the course is *Conceptual Physics*, 12<sup>th</sup> Edition by Paul Hewitt, Addison-Wesley Publishers. 2015

Other textbooks will be considered by the faculty liaison on case-by-case basis.

**The following topics should be covered in this course:**

1. Description of linear motion, velocity and acceleration
2. Newton's Laws
3. Momentum, impulse and conservation of energy
4. Gravitational force, projectile, rotational motion and Kepler's Laws
5. Atomic nature of matter
6. State of matter: solids, liquids, gases and plasmas
7. Temperature, heat, change of phase and thermodynamics
8. Vibrations, waves, sound and musical sounds
9. Electrostatics, electric current, electric potential
10. Magnetism, causes of magnetic fields, electromagnetic induction
11. Properties of light, color, reflection and refraction
12. Light waves, light emission and light quanta
13. Brief discussion of nuclear physics
14. Special theory of relativity

**Course objectives:** This course exposes the students to the laws of physics and applies them to various systems using a nonmathematical approach. It helps the student be a critical thinker by understanding and carefully examining the physics fundamentals.

**Grading:** The final grade will be determined using a variety of assessment methods including quizzes and exams.

### **Pitt Grading System:**

All courses required to satisfy associate and baccalaureate degree requirements-including all courses required for a major, a minor, or general education-must be taken for letter grades, with the exception of those courses designated as graded S and NC only. Pitt-Bradford uses 13 earned letter grades. They are listed below with their equivalent quality point values.

A+	4.00
A	4.00 superior achievement
A-	3.75
B+	3.25
B	3.00 meritorious achievement
B-	2.75
C+	2.25
C	2.00 adequate achievement
C-	1.75
D+	1.25
D	1.00 minimal achievement
F	0.00 failure

**Academic Integrity and Plagiarism:** Members of a university community, both faculty and students, bear a serious responsibility to uphold personal and professional integrity and to maintain complete honesty in all academic work. Violations of the code of academic integrity are not tolerated. Students who cheat or plagiarize or who otherwise take improper advantage of the work of others face harsh penalties, including permanent dismissal. The academic integrity guidelines set forth student and faculty obligations and the means of enforcing regulations and addressing grievances.

**Grades:** Grade criteria in the high school course may be different from the University standards. A CHS student could receive two course grades, one for high school and one for the University transcript. In most cases, the grades are the same. Grading standards should be explained at the beginning of the course.

**Transfer Credits:** Grades earned in CHS courses appear on an official University of Pittsburgh transcript and the course credits may be eligible for transfer to other colleges and universities. Students should contact potential colleges and universities in advance to be sure their CHS credits will be accepted. If students will attend any University of Pittsburgh campus, grade earned in the course will count toward the student grade point average at the University. At the University of Pittsburgh, the CHS course supersedes any equivalent AP credit.

**Drops and Withdrawals:** Students should monitor their progress in a course. A CHS teacher can contact the program administrators to request a drop or withdrawal. Dropping or withdrawing from the CHS course has no effect on enrollment in the high school credits.