

2025-2026

Science

Course Offerings

BIOLOGY AND BIOLOGY HONORS

Prerequisites: Students' initial placement is determined by their math placement scores, teacher recommendations, and transcripts.

Third form (9th grade) students begin their high school science study with a course that allows active participation in investigating fundamental scientific principles. Throughout this comprehensive course, students will delve into the fundamentals of life, exploring the intricate workings of living organisms at the molecular, cellular, and systemic levels. By examining key concepts in biochemistry, cellular biology, genetics, evolution, and comparative anatomy, students will gain a deep understanding of the complexities of the natural world. Through a combination of dialogue, collaboration, and investigations, students will develop critical scientific thinking skills and improve their ability to effectively analyze data and communicate complex biological concepts. The Honors Biology moves at a faster pace and asks students to produce work that displays a greater depth of knowledge.

BIOLOGY (ADVANCED)

Prerequisites: First year biology and first year chemistry with B grades or better.

Challenge yourself by taking a deeper dive into biological concepts in this second-year course. This fast-paced laboratory science will be divided into three major areas of study. During the first trimester we will investigate cellular energetics and physiology; in the second trimester we will study genetics and cell communication; and in the final trimester we will focus on ecology and evolution. You will need to think independently as you analyze data, research topics, and study biological processes. Laboratory work will require you to design and perform experiments in collaboration with your classmates.

CHEMISTRY AND CHEMISTRY HONORS

Prerequisites: Typically, chemistry students have completed a biology course.

During this first year Chemistry course, students will explore modern atomic theory and how it applies to the chemical interaction of matter. Using mathematical models and analyzing data, the student will make connections between the nature of matter and atomic structure to a variety of aspects of chemical reactions, including predicting the products of a chemical reaction and calculating the amount of a product that will be formed during the reaction. All discussions and lab work relate to the general theme of how matter and energy work together to produce interactions in the natural world.

CHEMISTRY (ADVANCED)

Prerequisites: Successful completion of a first-year chemistry course and a math course equivalent to Algebra II.

Do you want to dive deeper into the chemical phenomena studied during your first-year course? If so, this second-year course in Chemistry is for you. The concepts covered in this course will be equivalent to those of a first-year college course. During the first trimester, we will build on the previous foundation of gases and solutions to further explore the various types of chemical reactions. During the second trimester, we will jump into chemical kinetics and equilibrium, where we will examine concepts like pH and buffer solutions. We will finish the year by looking at the thermodynamics behind chemical reactions and the topic of electrochemistry to explore the chemistry



behind how batteries work. Throughout the year, we will use mathematical models and the analysis of data collected during laboratory experiments to make connections between the various concepts we explore.

PHYSICS

Prerequisites: Typically, physics students are in 11th or 12th grade and have completed biology and chemistry courses.

Physics is an immersive, conceptual, year-long course that explores meaningful questions such as: How can we design more reliable systems to meet our communities' energy needs? How do forces on Earth's interior determine what will happen to the surface we see? How do we use radiation in our lives, and is it safe for humans? And what can we do to make driving safe for everyone? Students collaborate to figure things out together and design investigations to master physics principles, practice cross-cutting concepts, and develop their science practices.

PHYSICS HONORS

Prerequisites: Strong algebra skills (equivalent to Quant 2 Honors)

Do you want to ride a mini hovercraft all the way across a gym floor? Or compete with your classmates to see who can crash two small cars closest to a designated spot? Would you enjoy building your own circuits, and determining if the resistance of real light bulbs changes when they are cold versus hot? Launching a marble off a table to try to get closest to a bullseye? Honors Physics helps you to understand the world around you, from motion and forces to energy and circuits. We use hands-on demonstrations and labs to experience the concepts, and then we delve deeply into the physics descriptions, equations, and algebra to help us understand what we are seeing. This is a mathematically grounded class that builds a strong conceptual understanding of algebra-based Newtonian mechanics as well as an introduction to electricity and circuits. Don't let hard work scare you away – Physics is Phun!

PHYSICS 1 (ADVANCED) (FIRST-YEAR COURSE)

Prerequisites: Successful completion of a math course equivalent to Algebra II.

If you want to learn principles of physics at a college level, this course may be for you! The basic building blocks of Newtonian Mechanics, Thermodynamics, and Fluids are beautifully applicable to the world around you. Do you want to be able to experimentally determine the acceleration of an airplane as you take off? Know how to extricate a car stuck in the mud? Look at the orbit of the moon in a new light? Calculate the pre-braking speed of a car by looking at the skid marks left behind? Measure the speed of sound in air? Understand how airplanes fly? Know how a refrigerator works? You will be able to do all of this and more in Advanced Physics. The goal of this course is to learn to solve physics problems with an understanding of fundamental concepts and mathematical tools. Hands-on work in the laboratory is an essential part of building this knowledge, so you will also develop your data-taking and analysis skills.

PHYSICS C (ADVANCED) (SECOND-YEAR COURSE; CALCULUS-BASED)

Prerequisites: Successful completion of Advanced Physics I and previous or current enrollment in calculus.

Advanced Physics III is a second-year physics course in which the major fundamental topics of classical mechanics and electricity and magnetism are studied in greater depth. With greater depth comes a greater mastery of the basic



topics in physics, and a greater appreciation for the beauty and power they hold! In addition to the course's theoretical work, students design and execute their own independent experiments over the year, conducting research and presenting to peers like working scientists do!

ENVIRONMENTAL SCIENCE (ADVANCED) (DUAL ENROLLMENT)

Prerequisites: a course in biology, a course in chemistry, and either a course in physics or an advanced biology or chemistry course.

During the first trimester of Advanced Environmental Science, students perform an in-depth study of the ecology and biodiversity of Western North Carolina, particularly drawing on our 300-acre campus, which serves as a living laboratory. In the second and third trimesters, students apply their knowledge to the study of environmental sustainability. Throughout the course, students analyze case studies, discuss the impact of human activity on the environment, and participate in labs, research, and projects to deepen their understanding of the natural environment. Students enrolled in this course are dually enrolled in BIO 140 at our local community college, A-B Tech; they will be awarded four college credits upon successful completion of this course. Those who choose to do so may also sit for the national AP Environmental Science exam in May.

ANATOMY AND PHYSIOLOGY

Prerequisites: a course in biology, a course in chemistry, and either a course in physics or an advanced biology or chemistry class.

Anatomy and Physiology is offered as an elective course. Through a conceptual framework, students learn major organ systems in the human body. Systems studied in depth include the integumentary system, skeletal system, muscular system, nutrition, special senses and the cardiovascular system. Instruction in this course is varied and includes laboratory exercises, animal dissections, and inquiry into fundamental physiological principles. Students develop skills that can be used to analyze and evaluate current medical and health issues.

PSYCHOLOGY

Prerequisites: open to 10th grade students and higher in good academic standing. Typically, Psychology students are concurrently enrolled in another science course or have completed our departmental requirements.

Psychology is offered as an elective course. Topics include research methods and scientific experiments, the brain and nervous system, motivation and emotion, health, stress and coping, and disorders and treatments. Instruction in this course is varied and includes lectures, case studies, group projects, research and presentations, and varied media support. Students develop skills that include data analyzation, working with scientific explanations, connecting concepts, and posing and evaluating questions to expand understanding.



Science Course Levels: Standard, Honors, and Advanced

STANDARD COURSES

Standard courses introduce the core scientific disciplines of biology, chemistry, and physics. They focus on building foundational knowledge at a moderate pace with ample support and practice.

HONORS COURSES

Honors courses cover the same subjects as Standard but progress faster and delve deeper into content. These courses demand higher math fluency (especially in physics and chemistry), emphasize independent study, and require more original work, such as research papers instead of posters. Homework typically takes about 30 minutes per night.

ADVANCED COURSES

Advanced courses, formerly Advanced Placement (AP) classes, go beyond introductory material, integrating prior knowledge with rigorous instruction. They require prerequisites (e.g., prior exposure to biology, chemistry, or relevant math concepts) and emphasize independent study and reading. Homework may exceed 45 minutes per night.

PLACEMENT GUIDELINES

Placement in Honors or Advanced courses is based on a comprehensive review of:

- Grades from the past two years
- Teacher recommendations
- Placement tests
- Standardized test scores

An A in a Standard course does not automatically qualify a student for Honors.

KEY DIFFERENCES ACROSS COURSE LEVELS

1. **Pace and Rigor:** Honors and Advanced courses move faster and require students to quickly grasp concepts. High absenteeism can hinder success.
2. **Independence:** Students must master concepts with fewer examples and apply them independently.
3. **Application Over Memorization:** Emphasis on solving abstract problems and applying concepts in different contexts.
4. **Continuous Learning:** Topics build on previous lessons, requiring retained mastery.
5. **Workload:** Honors and Advanced courses cover more material, with Advanced requiring the most time and effort.
6. **Assessment Standards:** No grade boosts or test corrections are offered. Grades reflect rigorous expectations.
7. **Academic Maturity:** Students must demonstrate resilience, self-advocacy, and commitment to learning.



RECOMMENDATIONS FOR STUDENTS

To succeed in Honors or Advanced courses, students should:

- Have a strong interest in science and math content and skills.
- Be willing to manage the increased workload and balance their schedule.
- Demonstrate a dedicated work ethic and the ability to engage with abstract concepts.

Placement decisions aim to match students with courses that align with their skills and support long-term success in science.

