

# Course Descriptions from Teachers for Blitz Week

## Dual Credit Anatomy and Physiology 1: Juniors or Seniors

## AP Physics 1 versus Honors Physics versus Level Physics versus Principles of Technology: Juniors

All Juniors must take some form of physics. Physics is the study of Motion, Forces, Electricity, Sound, and Light. Every unit involves significant math problem solving.

Most students will take Level Physics. It is the expected next step after Level Chemistry. Level Physics students are typically concurrently enrolled in Level Algebra II.

Honors Physics follows the same scope and sequence as Level, but the expectations for conceptual understanding and math problem-solving are significantly higher. Most Honors Physics students are enrolled in Honors Algebra II or pre-Calculus. Students in Level Algebra II are usually not successful in Honors Physics.

AP 1 focuses on the “Mechanics” topics in physics: motion, forces, energy, momentum, etc. The expectations are significantly higher in AP than in Honors. Students not enrolled in PAP pre-Cal are rarely successful. Students must have the maturity for significant independent learning, as the class must move quickly through the topics to fully cover the curriculum, and class time must be spent focused on the most challenging problems and lab topics.

Principles of Technology is a limited enrollment class for Juniors with low math skills. These are typically students who failed Algebra I, and are enrolled in Math Models as Juniors. All physics topics are covered, but primarily conceptual, with simplified math applications. Students may not sign up for this class without counselor permission.

## AP Physics C

AP Physics C is a calculus-based, college-level physics course to be taken as a second-year physics course (primarily by seniors).

1. The first semester covers Mechanics which includes topics such as: kinematics; Newton’s laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; oscillations; and gravitation. (this semester will be very fast-paced)
2. The second semester covers Electricity & Magnetism which includes topics such as: electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism.
3. Students must have been previously enrolled (and ideally very successful in) either AP Physics 1 or Honors Physics
4. Introductory differential and integral calculus is used throughout the course, so students must be concurrently or previously enrolled in AP Calculus (AB or BC).
5. AP Physics C is especially appropriate for students planning to specialize or major in physical science or engineering. (basically, any STEM major)
6. AP test scores could result in college credits for both Physics 1 and Physics 2 (either engineering physics or general physics credits).
7. Students must be concurrently (or previously) enrolled in AP Calculus (AB or BC) and must have previously taken AP Physics 1 or Honors Physics as a junior.

First semester covers Mechanics:

1. AP Physics C: Mechanics is a one semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in one of the physical sciences or engineering.
  2. Students cultivate their understanding of physics through classroom study and activities as well as hands-on laboratory work as they explore concepts like change, force interactions, fields, and conservation.
  3. Units of Study: Kinematics (1D & 2D), Newton's Laws, Work & Energy, Linear Momentum, Rotational Motion, Gravity & Oscillations
- Second semester covers Electricity & Magnetism:
    - Physics C: Electricity & Magnetism course is a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering.
    - The AP Physics C: Electricity and Magnetism course applies both differential and integral calculus, and builds upon previous physics course by providing instruction in each of the following five content areas: electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; electromagnetism.
    - Units of Study: Electric Fields & Forces, Electric Potential, Circuits with Resistors & Capacitors, Magnetic Fields & Forces, Electromagnetic Induction

## **SRD2 (Robotics)**

Honors-credit robotics course for seniors interested in engineering and design. Students who enroll may or may not have previous robotics experience, but they should have been a very strong physics student during their junior year. Students will have the opportunity to conceptualize, design and build a small-scale robot to compete as part of a robotics team. Homework is rare, but it may require time commitment outside of the school day during build and competition season. There will be a class fee that goes towards purchasing supplies and registration fees.

## **Astronomy**

Astronomy - Designed to imitate a collegiate course targeting liberal arts or non-science majors, Astronomy students will explore the latest in astronomical developments without the math that would accompany a more technical course. Topics include The Big Bang, History of Astronomy, Planetary Science, Dark Matter & Energy, Constellations, Alien Life and the history of manned space flight.

Math Pre-requisites - none

Homework - rare

## **Earth and Space Science**

The Earth and Space Science course is designed to teach students how to interpret and understand the physical attributes of the planet on which we live. Learners will explore the interconnections between Earth's four major spheres: geosphere, atmosphere, hydrosphere, and biosphere in order to understand planetary formation, processes, landscapes, and why planets change over time. Topics covered include the scientific method, terrestrial and gaseous planets, minerals, rocks, earthquakes, volcanos, plate tectonics, geologic time, oceanography, and meteorology. All of these topics are related and give us an appreciation for how our planet has evolved throughout geologic time. A range of hands-on laboratories reinforce concepts and make learning fun. At the end of this course, students will be prepared for college level science courses that may lead to careers in Geology, Geophysics, Engineering, Oceanography, and Meteorology.

## **Aquatic Science - science elective**

This is a field based (outside) lab based class. This is for students who love to learn by doing things, and being outside. (Generally every two weeks) We study the TWHS pond and Bear Branch creek and all of the organisms that live in and around freshwater. We catch fish and other aquatic animals and learn how to identify them while learning about aquarium husbandry in the classroom throughout the year. Hurricanes, El Nino, mammal track identification, specific fish identification and state of Texas Game and Fish regulations are also discussed.

## **AP Environmental Science**

**AP Environmental Science** - this class is a 4<sup>th</sup> year science elective geared towards juniors and seniors with an opportunity to earn AP/college credit. This course teaches students how to apply science to the solutions of important social problems such as sustainability, biodiversity, human population growth, using earth's resources, energy solutions, pollution, and global change. The class features a lot of hands-on learning, labs, group work, field work, fun activities and lecture. Creek days are often the most exciting and memorable days! Most students earn an A or B in this class and there are LOTS of opportunities for extra credit. Each year some students have earned scholarships through our work and participation with the local community. Past students have changed their majors to environmental fields because they were so inspired after taking this class so come join us! There are no pre-requisites but a background in biology, chemistry, and at least algebra II or higher is recommended though there is not a substantial amount of math.

## **Organic Chemistry**

This is a senior elective honors class for those who have completed Physics. Although AP Chemistry is not a prerequisite, it is recommended for some of the concepts covered. This class is a great introduction for Organic Chemistry, which will allow you to be much better prepared to take this course in college. There is a lot of memorization involved, but not a lot of actual homework.

## **AP Chemistry**

Click Here for [AP Chemistry Promotional Video to play for Blitz Week](#)

Students who are most successful in AP Chemistry:

- \* Received an 85 or higher in Pre-AP Chemistry.
- \* Students who took level chemistry may be lacking some calculation skills necessary, so they would need to learn some of these missing concepts outside of class.
- \* Were successful in Algebra II
- \* Are highly motivated and willing to devote an hour or more per night to Homework and/or studying
- \* Are good problem solvers and have good critical thinking skills – able to apply information given to new situations.
- \* Are adept at using a graphing calculator.
- \* Are able to accurately explain the reasoning behind scientific concepts in a clear and concise written essay.

All tests are given in the AP Exam format – they are timed with a multiple choice section where a calculator is not allowed and a free-response calculation and essay section where a calculator is allowed.

## **Lab Management:**

**Prerequisite:** AP Chemistry and by AP Teacher recommendation.

The Lab Management class is for students who were very successful in AP Chemistry and who have a proven ability to follow proper safety practices and procedures in the lab.

Students will

- maintain a current and up-to-date database inventory of all chemicals used in the Chemistry department
- maintain proper labeling, storage and disposal of lab materials and chemicals
- assist in the proper storage and cleaning of chemical glassware and instrumentation
- maintain the safety, organization and cleanliness of chemical storage rooms and chemical storage closets
- prepare dilutions and solutions needed by Chemistry department teachers
- gather materials and equipment to prepare lab set-ups and demonstrations for Chemistry department teachers

**Please note:** Class size is limited. Interested students must fill out an application and be approved by an AP Chemistry teacher.

## **Forensic Science:**

**Prerequisite:** Biology and Chemistry.

**Recommended prerequisite:** Physics, strong math skills.

Forensic Science is a course that uses a structured (lab based) and scientific approach to the investigation of crimes of assault, abuse and neglect, domestic violence, accidental death, homicide, and the psychology of criminal behavior. Students will learn terminology and investigative procedures related to crime scene, questioning, interviewing, criminal behavior characteristics, truth detection, and scientific procedures used to solve crimes. Using scientific methods, students will collect and analyze evidence through case studies and simulated crime scenes such as fingerprint analysis, ballistics, and blood spatter analysis. Students will learn the history, legal aspects, and career options for forensic science.

## **AP Biology**

**Who takes AP Biology?** Mostly seniors but juniors can take it too. If you will be a junior, you have to take physics at the same time. (Watch your schedule and don't overload it!)

**Prerequisites:** Successful completion of Biology I and Chemistry I

AP Biology is the equivalent to 2 semesters of college freshman biology. This class will expand on the concepts and themes you learned in Biology I, and will cover them in much more depth and detail. Topics covered include: Scientific Investigations, Graphing, Statistics; Biochemistry; Cells; DNA & The Cell Cycle; Meiosis & Genetics; Molecular Genetics; Evolution; Cell Communication; Body Systems: Endocrine System, Immune System, Nervous System; Cell Energy: Cell Respiration and Photosynthesis; Ecology; AP Review & Practice. There is math and statistics in AP Bio, but we do get to use calculators and have a formula sheet.

**Why take AP Bio?** It is fun! We do lots labs! You can earn up to 8 hours of college credit based on your AP exam score.

If you like Biology and are interested in earning college credit whether or not you major in science in college or if you are interested in a career in the medical field, biomedical engineering, life science, or education then you might enjoy AP Biology.

## **Pathophysiology**

Pathophysiology is the study of how disease processes affect the structure and function of the human body. Emphasis will be placed on studying the prevention and treatment of disease. The course is intended for students interested in a career in medicine or an allied health field, such as nursing or pharmacy. Students need to have taken both biology and chemistry. Anatomy is not required. The course will link understanding disease states with underlying biological processes.