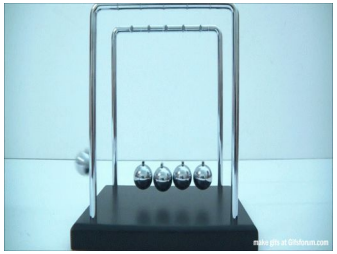
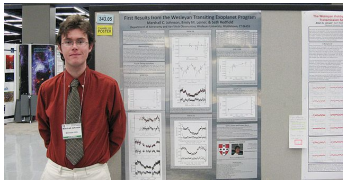
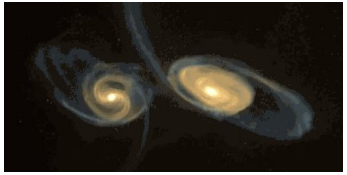
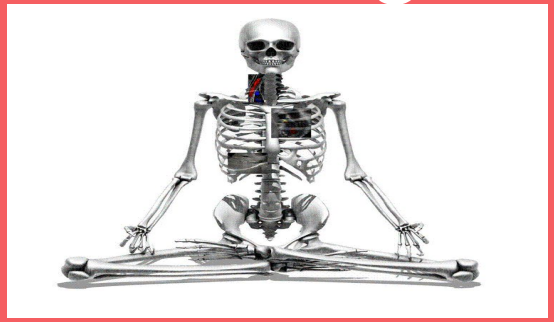




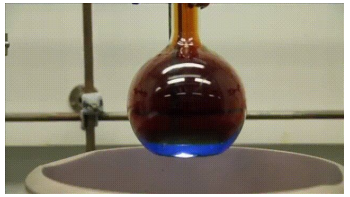


Science Course Offerings



Wilson High School

2020-2021



Science Sequence

Core Science Sequence Required for all students

9th Grade ~ Physics: NGSS

10th Grade ~ Chemistry: NGSS

11th Grade ~ Biology: NGSS

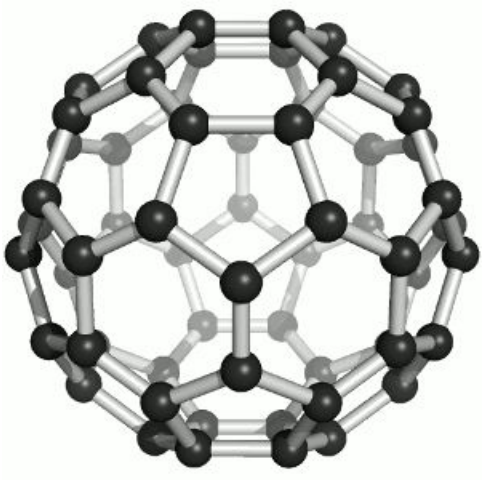
12th Grade ~ No required courses, choose an advanced science class (or two) that interests you!

Chemistry: NGSS

All sophomores are required to take this course.

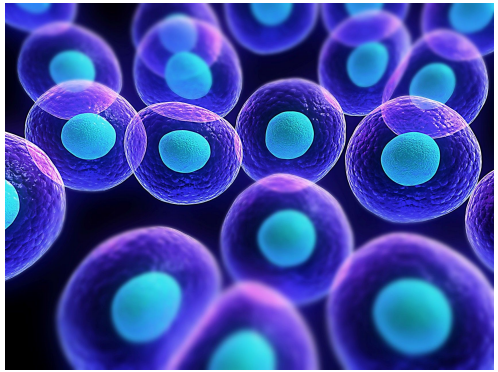
Topics include:

1. Kinetic Molecular Theory
2. Atomic Structure and Radioactivity
3. Chemical Bonding
4. Chemical Reactions
5. Quantitative Chemistry
6. Solutions (Aqueous Chemistry)



Biology: NGSS

All juniors are required to take this class.



This lab based course focuses on the core ideas of modern Biology. These ideas are building upon student's science understanding of disciplinary core ideas, science engineering practices, and applying concepts from physics and chemistry.

Topics include: biochemistry, cellular structure and function, inheritance and variation of traits, matter and energy in organisms and ecosystems, interdependent relationships in ecosystems, natural selection, evolution, and much more.

9th grade forecasting for 10th grade

All freshman will forecast for Chemistry: NGSS as sophomores

In addition to NGSS Chemistry, you may also sign up for an elective science course, those options are:

- Earth and Space Science
- Forensic Science
- Climate Justice
- Engineering 1-2
- Physics 3-4 / AP Physics 2

10th grade forecasting for 11th grade

All sophomores will forecast for Biology: NGSS as juniors

In addition to Biology: NGSS, you may also sign up for an elective science course, those options are:

- Anatomy and Physiology
- Climate Justice
- Earth and Space Science
- Engineering 1-2 and 3-4
- Forensic Science
- PSU Geology
- AP Chemistry
- AP Environmental Studies
- Physics 3-4 / AP Physics 2
- AP Physics C (Mechanics)

AP Biology is only available to seniors who have already taken Biology: NGSS - so plan ahead and leave space in your schedule for this awesome class!

11th grade forecasting for 12th grade

The NGSS recommended core science sequence includes four courses, Physics, Chemistry, Biology and Earth and Space Science. In order to cover all of the state standards, we suggest that senior students take at least one **Earth and Space Science Elective (bold)** as well as electives in other interest areas if possible.

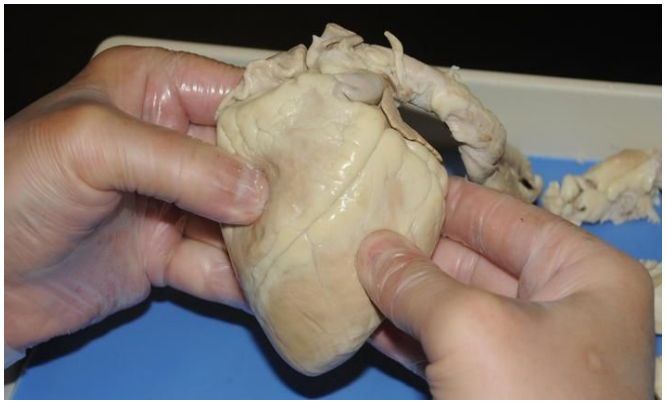
- Anatomy and Physiology
- **Climate Justice**
- **Earth and Space Science**
- Forensic Science
- Engineering 1-2
- Engineering 3-4
- **PSU Geology**
- AP Biology
- AP Chemistry
- **AP Environmental Science**
- Physics 3-4 / AP Physics 2
- AP Physics C (Mechanics)

Science Electives

Anatomy and Physiology

Interested in a career in **healthcare**? Are you an **athlete**? Do you have a **body**? This is the class for you. In this lab-based class you will learn about the body, its parts, and how they work together to make you, you.

This class is part of the **Health Sciences** CTE Pathway and is available for **dual-credit** through Oregon Institute of Technology.



Prerequisites: Grades 11 & 12 only, previous or concurrent enrollment in NGSS Biology. Grade of C or higher in Chemistry recommended.

Climate Change/Climate Justice

This class has three parts:

(1) studying the climate system of our planet

(2) examining impacts of climate change and policy solutions on societies (from local to world-wide)

(3) advocating for solutions that reduce/eliminate human caused climate change that are mindful and equitable for all

The goal of the class is for students to develop the skills necessary to understand climate change, the possible solutions for climate change, and how to advocate for those solutions, playing a role in the future of our community and planet.

Open to all, 11-12

This Is Different From The Forecast Guide Description

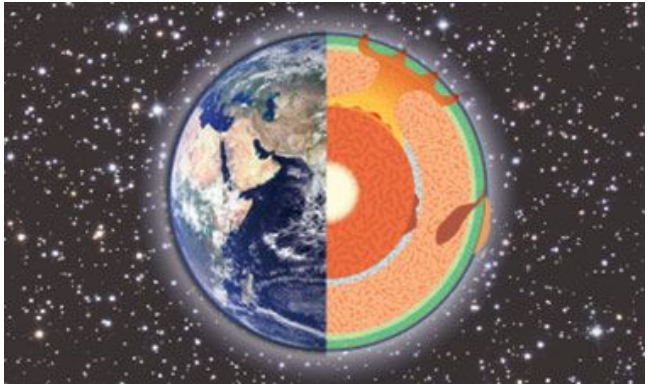
Earth & Space Science

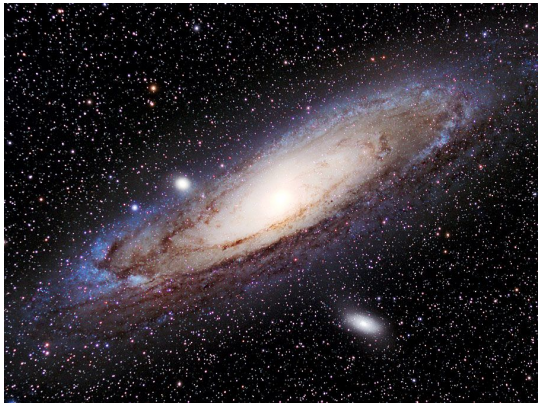
This class is an overview of Earth Science and Space Science.

In space science (Semester 1) we will learn observational astronomy, the latest ideas about our solar system, all about how stars work, the nature of galaxies, and the quest for finding life beyond Earth.

In Earth science (Semester 2) we will study the structure of the Earth (plate tectonics!), its composition (minerals and rocks!), it's history (fossils!), and its oceans and atmosphere (climate change!)

Prerequisites: Grades 10-12





Forensic Science

Recommended for Sophomores through Seniors who have an interest is seeing how actual crime scene analysis works and is used in criminal and civil case law through a series of hands-on labs.

(Bunnysuits not included)

Sample Topics Include:

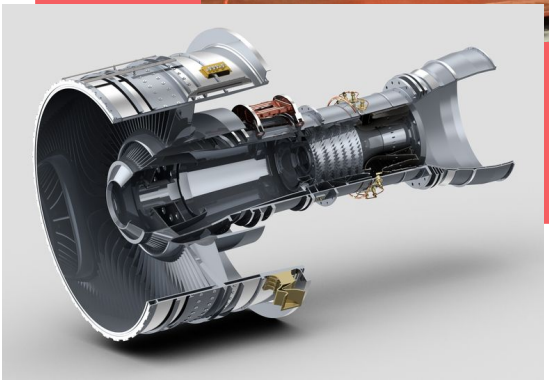
- Fingerprints
- Impressions
- Trace Evidence
- Blood Splatter/Spatter
- DNA
- Much, Much More!

Prerequisites: Grades 10-12

Engineering 1-2:
Introduction to Engineering Design

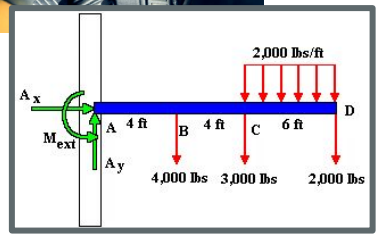
This hands-on, project-based course is structured to provide students with an introduction to engineering design, overview of engineering specializations, and exploration of engineering ethics. Students will become familiar with a standard engineering design process, which is utilized in a variety of activities, maker challenges, and student-designed projects. Emphasis is also placed on the importance of documentation and clarity of technical communication. Students enrolled in this course should be self-motivated and have a strong interest in creative problem-solving.

Prerequisite: Grade of C or above in Physics: NGSS



Engineering 3-4:
Mechanical and Materials Engineering

This course is intended for students interested in engineering mechanics and materials science. General topics covered include statics, dynamics, and mechanics of materials. Students will learn how the mechanical and microstructural properties of materials are analyzed and have the opportunity to evaluate specific materials using common techniques and lab instruments (mechanical testing, scanning electron microscopy, metallographic etchants and optical microscopy). Guest speakers and field trips will make connections between theoretical concepts and real world applications. Prior experience working in the metals shop is desirable but not required.



Prerequisite: Engineering 1-2; ***or*** Grade of C or above in both Physics 1: NGSS and Chemistry 1: NGSS; ***or*** recommendation of instructor

Engineering Robotics

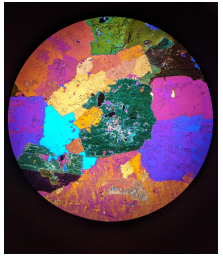
This hands-on, project-based course is appropriate for self-motivated students at all levels of robotics. It is a cross-disciplinary program covering multiple aspects of engineering: design, construction, and deployment. Students learn/use mathematics, physics, electronics, programming, oral and written communication, computer-aided design, automation, mechanical construction, and project planning. The class structure is student-centered with a strong focus on creativity and collaboration.

Prerequisite: Engineering 1-2 or recommendation of instructor

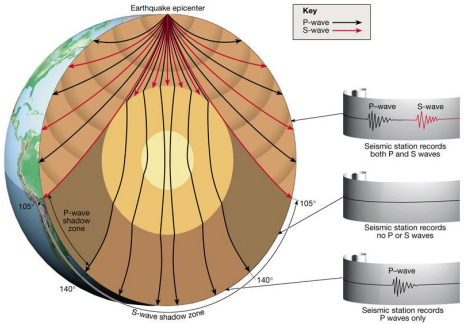
PSU Geology

Are you interested in volcanoes, earthquakes, and mineral crystals? Do you want to understand the origin of the Columbia River Gorge and Mt. Hood? Take Geology!

This class is available for **dual-credit** through Portland State University. (**8** college credits!)



Mineral photo - by Mairi O'Toole



Course Eligibility

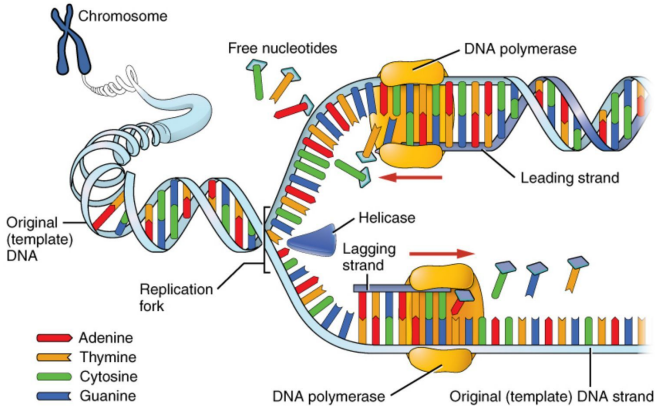
Required: Physics and Chemistry
Recommended: B or better in Physics and Chemistry.
Required for PSU credit: 3.0 GPA

More Info?

PSU Challenge Program brochure

AP Biology

AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through lab and inquiry-based investigations as they explore the following topics: evolution, cellular processes—energy and communication, genetics, information transfer, ecology, system interactions, feedback mechanisms, and much more.



Students will be prepared to take the AP Biology Exam for college credit

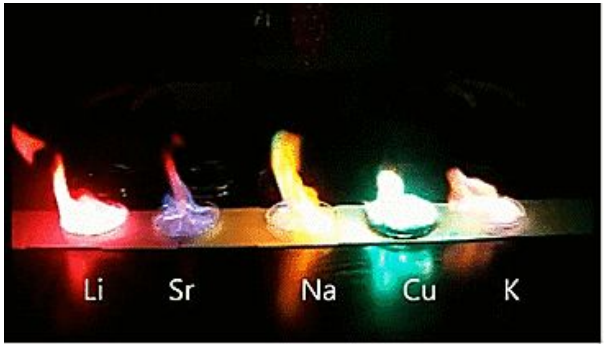
Prerequisites: Grade of C or higher in Biology: NGSS and in Chemistry: NGSS

AP Chemistry

Did you enjoy NGSS Chemistry? Want to uncover more truths about the chemical world? Take AP Chemistry, and potentially earn college credit!

Topics include:

1. Stoichiometry
2. Atomic and Molecular Structure
3. Intermolecular Forces
4. Thermodynamics
5. Kinetics
6. Equilibrium
7. Acids and Bases
8. Electrochemistry



Course Eligibility

Prerequisites: Grade of C or higher in Chemistry: NGSS and Physics: NGSS

Homework

Current students report about 2 hours of homework per week

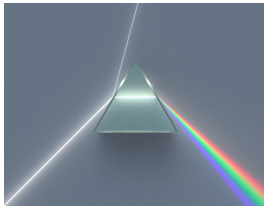
AP Environmental Science (APES)

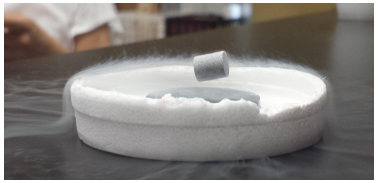
This class will study environmental principles, systems and relationships, as well as how humans interact with and effect these systems. This discussion, activity/lab based class will explore topics such as: populations, ecology, global change, ecological sociology, alternative energy, ecological economics and politics, natural or human made risks, the solutions for resolving or preventing them, and more.

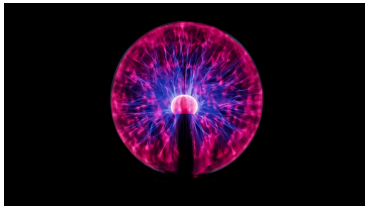
Students will be well prepared to take the AP Environmental Science Exam for college credit.

Prerequisites: Grade of C or higher in Chemistry: NGSS, Physics: NGSS, and in Algebra 3-4 (or concurrent enrollment)

Physics 3-4 / AP Physics 2







New Topics in Physics!

In this course, you will explore a variety of advanced Physics topics that are not covered in our other Physics courses including thermodynamics, electromagnetism, optics, modern physics and more.

This course is excellent preparation for a wide variety of science majors in college, including life science, medicine, chemistry, or engineering.

AP Credit awarded for all students who complete a summer assignment and take the AP exam.

Course Eligibility

Required Pre-Req: Physics and Algebra 3-4
Recommended: B or better in Physics and Alg 3-4

Homework

Current students report an average of 1.6 hours of homework a week.

More Info?

Note from the teacher (link)

This year's students think you should know… (link)

AP Physics C: Mechanics

Calculus-based Classical Mechanics

This class will study motion, forces that cause motion, energy, momentum, rotational motion, and waves. Lots of exciting labs. Students will be well prepared to take the official AP Physics C: Mechanics Exam.

This is a calculus-based classical mechanics course which will prepare you well for college majors in math, engineering, and architecture. WHS also offers an algebra-based classical mechanics course, AP Physics 1.

Homework: Expect to do 2-3 hours of homework per week.

Prerequisites: *Concurrent* enrollment in AP Calculus AB or higher level math class, Grades of B or higher in science classes.