SCIENCE

http://whs.rocklinusd.org/Academics/Science/index.html

Science – Scope & Sequence

Freshmen start their science sequence with Biology. The sophomore year students will focus on physical science. Students may double up on the offerings in Science during grades 11, and 12. Those wishing to accelerate their course of study in Science should see their counselor.

Life Science	Physical Science	Electives	
9th Grade	**10th Grade**	**11th/12th Grade**	**ROP Courses (11th/12th Grade)**
Biology	Chemistry/Honors	Anatomy/Physiology	ROP Automotive
Adv. Biology	Physics	AP Biology	ROP Automotive Technologies
	Geology	AP Environmental Science	ROP Baking and Pastry
		AP Chemistry	ROP AP Computer Science A
		AP Physics I/II	ROP Dental Careers
		Chemistry/Honors	ROP Fire Science
		Forensic Science	ROP Health Careers
		Geology	ROP Integrated Animal Science
		Marine Biology	ROP Medical Assisting
		Physics	ROP Sports Medicine
		Energy, Power and Business	

Please see 49er ROP section for a complete list of ROP course descriptions.

BIOLOGY

Grade Level: 9

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This laboratory science course studies the main concepts of biology with emphasis on the following: introduction to biochemistry, the cell, genetics, evolution and physiology.

ADVANCED BIOLOGY

Grade Level: 9

Prerequisite: Math 8 and grade of "A" in 8th grade Science. Students must have a signature from their 8th grade Science teacher on their Six-Year Plan to enroll in this course.

Corequisite: Concurrent enrollment in at least one other advanced freshman level course.

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This fast-paced year-long course is designed to prepare students for success in any of the AP Sciences. This course requires students to be highly motivated and willing to put in daily outside preparation. This is a laboratory science course that studies the main concepts of biology with emphasis on the following: introduction to biochemistry, plant and animal structures, genetics, evolution and ecology.

SCIENCE ELECTIVES

The following courses meet the **second and third** years of the WHS **elective Science** graduation requirement (20 credits).

ANATOMY/PHYSIOLOGY

Grade Level: 11-12

Prerequisite: Biology and a second year of science.

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

Students will study the major systems of the human body. Course emphasis will be on recognition and function of major features of the organ systems studied. Students will also apply their knowledge of organ functions to the exploration of typical organ system diseases. Labs will feature dissection of the mammalian organ systems. Labs will also include explorations of the functions of the organ systems studied.

CHEMISTRY I

Grade Level: 10-12

Prerequisite: A grade of "B" or higher in Biology, Geology (if applicable), and Algebra I/Integrated Math I.

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

General chemistry is an initial exposure to the field of chemistry for the college-bound high school student, taught in a manner to enable the student to grasp the basic concepts and to pursue knowledge through experimentation. Students will solve problems and apply the solutions to real world situations as well as discover and work with quantitative relationships that are fundamental to chemical reactions and the structure of matter.

CHEMISTRY- HONORS

Grade Level: 10-12

Prerequisite: Any student taking regular Chemistry can take Honors Chemistry.

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

Honors Chemistry is a course embedded within the General Chemistry class. Students are required to complete the required coursework for General Chemistry, but will also be expected to complete additional, advanced level work for every unit. There are three primary reasons for students to enroll: students intend to enroll in AP Chemistry, students intend to major in a science in college, or students find the general Chemistry curriculum not challenging enough. Students will need to be self motivated and work independently in order to be successful in this class, as these are important college preparatory skills. The expectation for students who choose to enroll in this class is that they are serious four-year college bound students. Work habits and academic performance are expected to exceed that of students in the college prep science classes.

ENERGY, POWER AND BUSINESS

Grade Level: 11-12

Prerequisite: Biology

Requirements Met:	WHS Science Elective ***OR*** Technology

This course provides a comprehensive study of the basic elements of energy, power, and how they affect the world of business. We will cover the resources, processes, and systems used in the current world while exploring how they play a role in our everyday lives. We will spend the year building and learning about projects that relate to the "real world." Our students will learn how to build DC circuits, wire residential outlets/switches, build insulated mini-houses, conduct energy audits, and challenge themselves to think like an engineer. The overall goal of this course is hands on application, while reinforcing the Engineering Standards of the Common Core Curriculum. This course depends on community support through donations of resources, which allows our program to keep the cost down.

FORENSIC SCIENCE

Grade Level: 11-12

Prerequisite: Biology and a second year of science.

Requirements Met:	WHS Science Elective	UC/CSU Approved "G"

This course is designed to give the students both theory and hands-on experience in the skills and knowledge required of a forensic science technician. Students will learn to collect, preserve and analyze criminal evidence used to solve cases, such as: fingerprints, DNA, blood, hair and handwriting samples. The students will prepare reports or presentations of findings, investigate methods, or laboratory techniques used in solving crimes. There is also a focus on famous cases that relate to the topics studied.

GEOLOGY

Grade Level: 10-12

Prerequisite: Biology

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

Geology is a physical lab science that introduces students to the systems responsible for Earth's dynamic nature. Students will study the origin, history and structure of the Earth and the processes that shape it. Material covered in this course falls under three broad categories: the universe and Earth's place in it, how and why Earth is constantly changing, and how Earth's surface processes and human activities affect each other. Major topics covered include the universe and its stars, formation of the solar system, history of Earth, Earth materials and systems, water and Earth's surface, natural hazards, natural resources, climate and weather, and California's unique geology.

MARINE BIOLOGY

Grade Level: 11-12

Prerequisite: Biology and a second year Science

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

Marine Biology is designed to introduce students to a world as immense, enchanting and mysterious as the one above ground – the ocean world. The marine environment will be explored as it relates to biology, geology, chemistry and physics. Through laboratory activities marine organisms will be explored relative to their functions, their different habitats and effects of organism interactions. The topics studied will include: environmental issues, marine resources, current research and aquatic ecosystems.

PHYSICS I

Grade Level: 10-12

Prerequisite: A grade of "B" or higher in Integrated II, Biology, and Geology (if applicable). Concurrent enrollment in Integrated III or higher (without a math lab class)

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This course is designed to engage students in everyday applications as well as professional applications of physics. This lab-based, college prep course will investigate a variety of physical phenomena through the use of computer-aided data retrieval and analysis. Students need to have strong math and critical thinking skills. This course is recommended for any student that is planning to attend a four-year university. Physics is essential for any student planning to major in the following: engineering, medicine, science, and math.

ADVANCED PLACEMENT BIOLOGY

Grade Level: 11-12

Prerequisite: A grade of "B" or higher in Biology and Chemistry

Fees: College Board testing fee ($TBA)

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

AP Biology is an intensive and accelerated study of biology. It is designed for students seeking additional challenges and preparation for college. This course is a part of a nationwide program sponsored by the College Board. It is intended to be a representative freshman course commonly offered in American Universities, but not necessarily identical with a course at any specific institution. Students take the AP exam at the end of this course. Students take the AP exam at the end of this course. Students who pass the test may receive college credit, advanced placement or both depending on the institution's policies.

ADVANCED PLACEMENT CHEMISTRY

Grade Level: 11-12

Prerequisite: A grade of "B" or higher in Honors Chemistry or a grade of "A" in Chemistry. Algebra II (grade of an "A" is highly recommended), and teacher approval

Fees: College Board testing fee ($TBA)

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This course is an intensive and accelerated chemistry program designed for students seeking additional challenge and preparation for college. The purpose of this course is to explore the fundamentals of chemistry by focusing on chemical calculations and laboratory experimentation. This course is part of a nationwide program sponsored by the College Board. It is intended to be a representative freshman course commonly offered in American universities, but is not necessarily identical with a course at any specific institution. Students take the AP exam at the end of this course. Students who pass the test may receive college credit, advanced placement or both depending on the institution's policies.

ADVANCED PLACEMENT ENVIRONMENTAL SCIENCE

Grade Level: 11-12

Prerequisite: Biology and a grade of "B" or higher in Chemistry or an "A" in Geology is recommended

Fees: College Board testing fee ($TBA)

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This course is a college level laboratory course that aims to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. The course aims to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them. This course is part of a nationwide program sponsored by the College Board. It is intended to be a representative freshman course commonly offered in American universities, but not necessarily identical to a course at a specific institution. Students take the AP exam at the end of this course. Students who pass the test may receive college credit, advanced placement or both depending on the policies at the specific institution.

ADVANCED PLACEMENT PHYSICS I

Grade Level: 10-12

Prerequisite: A grade of "B" or higher in Advanced Algebra II or a grade of "A" in Algebra II. Concurrent enrollment in Pre-Calculus or higher and teacher approval.

Recommendation: Physics I is not a prerequisite course but strong math skills are strongly recommended to do well.

Fees: College Board testing fee ($TBA)

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This is the first class of a two year course in AP Physics designed for students seeking additional challenge and preparation for college. AP Physics 1 is the equivalent to a first-semester college course in algebra-based physics. The course covers Newtonian Mechanics (including rotational dynamics and angular momentum); work, energy and power, and mechanical waves and sound. It will also introduce electric circuits. Focus of the class is based on scientific practices and inquiry investigation. This course is suggested for students interested in majoring in science, medicine, math, or engineering.

ADVANCED PLACEMENT PHYSICS II

Grade Level: 11-12

Prerequisite: A grade of "A" in Physics 1 or a grade of "B" or higher in AP Physics 1 and concurrent enrollment in pre-calculus or higher and teacher approval.

Fees: College Board testing fee ($TBA)

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This is the second class of a two year course in AP Physics designed for students seeking additional challenge and preparation for college. AP Physics 2 is equivalent to a second semester college course in algebra-based physics. The course covers fluid mechanics; thermodynamics, electricity and magnetism, optics, and atomic and nuclear physics. Focus of the class is based on scientific practices and inquiry investigation. This course is suggested for students interested in majoring in science, math, medicine, or engineering.

ADVANCED PLACEMENT PHYSICS C: MECHANICS

Grade Level: 11-12

Prerequisite: Concurrent enrollment in AP Calculus AB. Grade of "B" or higher in AP Physics 1.

Fee: College Board testing fee ($TBA)

Requirements Met:	WHS Science Elective	UC/CSU Approved "D"

This course ordinarily forms the first part of the college sequence that serves as the foundation in physics for students majoring in the field of physical sciences or engineering. The sequence is parallel to or proceeded by mathematics courses that include calculus. Methods of calculus are used wherever appropriate in formulating physical principles and in applying them to physical problems. The sequence is more intensive and analytic than that in the AP Physics B course. Strong emphasis is placed on solving a variety of challenging problems, some requiring calculus. This AP Physics C course is the first part of a sequence often taken in college that is very intensive with a laboratory component.