SCIENCE

GRADUATION REQUIREMENTS:

I. Twenty (20) units of Science classes as follows:
1 year (10 units) of a Life Science class
1 year (10 units) of a Physical Science class

LIFE SCIENCES:	PHYSICAL SCIENCES:
1. Biology*	1. General Science
2. Biology II*	2. Ag Earth Science
3. AP Biology (H)*	3. Chemistry*
4. Ag Biology *	4. Physics*
5. Ag Science I & II	
6. AP Environmental Science* (H)	

(* denotes a college prep lab science)

The college bound student should take General Science, Biology, Chemistry and/or Physics (depending on planned college major) and is strongly recommended to take a fourth year of advanced science (Biology II, AP Biology or AP Environmental Science). If a student fails the first semester of any college prep lab science, he/she may be removed from the class and need to repeat the course.

PHYSICAL SCIENCE CLASSES

GENERAL EARTH SCIENCE

GRADE LEVEL: 9th grade students will be enrolled in General Science unless they meet pre-requisites for Biology.
PREREQUISITES: None
CONTENT: General Science is a year-long course that will introduce the student to a variety of physical and earth science topics focused on the world around us. Students will be taught the foundations of scientific inquiry in earth science, physical science, geology.
Satisfies the UC/CSU "g" elective requirement.

AGRICULTURAL EARTH SCIENCE

GRADE LEVEL: 9-10
PREREQUISITES: students must plan to pursue four years of Agriculture Science Pathway
Agriculture Earth Resources is a course that meets the graduation requirement for General Earth Science and is the first phase for students interested in the agriculture education program/CTE Agriculture Pathway. The purpose of this course is to introduce students to the world of agriculture through the exploration of Earth Science. Students enrolled in this course will gain a deep understanding of scientific investigation and experimentation while exploring such topics as California Agriculture, Plate Tectonics, California Geology, Bio-geochemical Cycles, Earth's Atmosphere, Energy, Heat, Climate, and Astronomy. This course will also focus on leadership development, business management through the principles of accounting and computer applications, and an overview of the seven industry sectors of agricultures. Students enrolled in this course will been encouraged to participate in leadership training activities, public speaking events and become active members in the California Association Future Farmers of America (FFA). Participation in the FFA is part of their overall semester grade. **Pending UC/CSU "d" Lab Science requirement****

CHEMISTRY

GRADE LEVEL: 10 (with teacher approval), 11 – 12
PREREQUISITES: "C" grade or better in both semesters of Biology, and "B" grade or better in both semesters of Math 1 or teacher recommendation.
CONTENT: Chemistry is a year-long laboratory oriented course based upon the NGSS: Next Generation Science Standards. Major chemical concepts such as atomic theory and its relation to chemical behavior, chemical bonding, the mole and stoichiometry, molecular kinetics, energy relationships, solution dynamics, acids-bases, equilibrium, organic and biological chemistry. Concepts and skills are reinforced by hands-on laboratory experiences and integration of other branches of science. There is a large component of mathematical, analytical, data acquisition, and communication skills as well as interdisciplinary approaches to discovery. Applications to society, individuals, and the utilization of technology are included. **Satisfies the UC/ CSU "d" Laboratory Science requirement.****

PHYSICS

GRADE LEVEL: 10-12
PREREQUISITES: General Physical Science or Ag Earth Science and B- or better in Math 1, or permission of instructor.
CONTENT: Physics includes topics in both classical and modern physics. Working knowledge of algebra is required for the course. Understanding the basic physics principles involved and the ability to apply these

principles in the solution of problems are major goals of the course. The course will utilize guided inquiry and student-centered learning to foster the development of laboratory and critical thinking skills. **Satisfies the UC/CSU "d" Laboratory Science requirement**

AP PHYSICS 1 (H)

Not available in 2021-22; speak to a counselor regarding independent study options

GRADE LEVEL: 11 - 12

PREREQUISITES: Past or concurrent enrollment in math 3 Honors or Pre-Calculus and permission of instructor. If junior, Physics CP is recommended before AP Physics.

CONTENT: AP Physics 1 is an algebra-based physics course covering topics in Newtonian mechanics (kinematics, dynamics, momentum, rotational dynamics, and angular momentum), gravitation, work, energy, power, oscillatory systems, mechanical waves, and an introduction to simple electrical circuits. The focus of the course is on in-depth, student-led inquiry of these topics. Students will be expected to maintain a laboratory portfolio for these inquiries. **Satisfies the UC/ CSU "d" Laboratory Science requirement.****

LIFE SCIENCE CLASSES

BIOLOGY

GRADE LEVEL: 9 - 12

PREREQUISITES: 9th grade students must be enrolled in Math 1 Honors and score "Standard Exceeded" on the 8th grade Science CAASPP/SBAC test.

CONTENT: This year-long course will systematically study the science of living things, including their structure, function, evolution, and interrelationships. This course is based upon California State Content Standards in Science. Biology consists of biochemistry, genetics, evolution, plants, animals and ecology. Human anatomy and physiology are studied in detail, and laboratory investigations are emphasized. This course **satisfies the UC/ CSU "d" Laboratory Science requirement.****

BIOLOGY II

GRADE LEVEL: 11 - 12

PREREQUISITES: "C" grade or better in all semesters of both Biology and Chemistry and instructor approval.

CONTENT: A rigorous second-year course using a college-level text. Topics include histology, biochemistry, genetics, taxonomy, evolution, ecology, and physiology, with special emphasis on laboratory investigation. Students are expected to complete an independent research project during second semester and ***honors credit is available to those students who satisfy optional enrichment assignments***. The text is a college-level introductory text (Campbell Biology, Concepts and Connections, 2012, by Reece, Taylor, Simon, and Dickey). **Satisfies the UC/ CSU "d" Laboratory Science requirement.****

AP ENVIRONMENTAL SCIENCE (H)

Not available in 2021-22; this course is offered alternating years

GRADE LEVEL: 11-12

PREREQUISITES: "B" or better in both Biology and Chemistry, or instructor approval

CONTENT: This course will provide students with the scientific principles, concepts, and methodologies required to understand the inter-relationships of the natural world, 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 or preventing them. **Students are expected to take the AP Environmental Science Exam, or a 3-hour equivalent cumulative exam**. **Satisfies the UC/ CSU "d" Laboratory Science requirement.****

AP BIOLOGY (H)

GRADE LEVEL: 11-12

PREREQUISITES: "B" or better in all semesters of both Biology and Chemistry, or instructor approval

CONTENT: This course is designed to emphasize four main ideas in Biology: 1). Evolution drives diversity and unity, 2). Biological systems utilize energy and molecular building blocks to grow, reproduce, and maintain homeostasis, 3). Living systems retrieve, transmit, and respond to information essential to life processes, and 4). Biological systems interact, and these interactions possess complex properties. Special emphasis is placed on scientific inquiry and reasoning, and students are expected to complete an independent research project during second semester. **Students are also expected to take the AP Biology Exam, or a 3-hour cumulative equivalent exam. Satisfies the UC/ CSU "d" Laboratory Science requirement.****

NOTE: Both Ag Science I or Ag Earth Science & Ag Science II satisfy the BUHS Life Science graduation requirement.

AGRICULTURE SCIENCE I

GRADE LEVEL: 9 - 12

PREREQUISITES: None

CONTENT: This year-long class covers basic knowledge of beef, sheep, and swine species in the animal industry with emphasis in the following areas: breed contribution to the industry and terminology, nutrition, basic management practices - especially involving market livestock, basic health and sanitation practices, and an overview of California, National, and International Agriculture. An introduction to various agriculture occupations is covered throughout all the vocational agriculture courses as well as presentations by post-secondary educators. All Agriculture Science courses involve record keeping on the School Farm Foundation as well as accounting on individual supervised occupational experience projects. Learning abilities are applied in the following areas of market livestock project involvement: project scope, budgeting, merchandising, financing, contracts, selection/judging, fitting and exhibiting, marketing and carcass evaluation, and processing and results evaluation. All Agriculture Science courses involve knowledge of the Future Farmer Organization as well as a general overview of U.S. and California Agriculture. This class is the first part of the agricultural core curriculum. After completing this course, students have a strong foundation in animal science and a basic knowledge of plant science, natural resources, agricultural business, California agriculture, leadership skills, record keeping, and FFA. FFA is an integral part of agricultural education, and by being in this course students are automatically an FFA member and have the right to participate in all Bishop Future Farmer meetings and events.

AGRICULTURE SCIENCE II

GRADE LEVEL: 10 - 12

PREREQUISITES: Agriculture Science I and teacher approval.

CONTENT: This year-long class includes evaluation of our market livestock project program as well as evaluation of our Foundation Management program. Primary emphasis is on market livestock selection; livestock health and sanitation practices and application, Cooperatives in Agriculture, Foundation and supervised project record keeping; basic pasture and range management practices including irrigation, soils management, and pasture rotation. An evaluation of the commercial livestock management practices: genetic goals, health practices, accounting practices, and basic management procedures. This class is the second part of the agricultural core curriculum. After completing this course, students have a stronger foundation in animal science and a broader knowledge of plant science, natural resources, agricultural business, California agriculture, leadership skills, record keeping and FFA. FFA is an integral part of agricultural education, and by being in this course students are automatically an FFA member and have the right to participate in all Bishop Future Farmer meetings and events.

AGRICULTURAL BIOLOGY

GRADE LEVEL: 10-12

PREREQUISITES: Agriculture Science I with teacher approval or Agricultural Earth Science.

CONTENT: Agricultural Biology is a one-year, laboratory science course designed for the college-bound student with career interests in agriculture. Using agriculture as the learning vehicle, the course is designed to provide advanced students with a greater understanding of the characteristics and functions of living organisms as well as provide students with the opportunity to develop their skills in scientific investigation, which will include projects requiring research. Topics include scientific methodology, cellular structure and function, evolutionary processes, genetics, ecology, anatomy and physiology. The Agri-science Pathway helps students acquire a broad understanding of a variety of agricultural areas, develop an awareness of the many career opportunities in agriculture, participate in occupationally relevant experiences, and work cooperatively with a group to develop and expand leadership abilities. Students study California agriculture, agricultural business, agricultural technologies, natural resources, and animal, plant, and soil sciences.

Satisfies the UC/CSU "d" Laboratory Science requirement.**

**** These College Prep Science courses must be passed with a grade of "C" or better to satisfy the UC/CSU "d" Laboratory Science requirement.**