Science Department Sequence

→ Standard Sequence - - → Optional Sequence

Freshman Year	Sophomore Year	Junior Year	Senior Year
Biology (Honors) 400	Chemistry (Honors) 400	Physics (Honors) 400	* Anatomy & Physiology * AP Science Course * Bio II Research Questions in Biology * Research Topics in Earth Science
Biology 300	Chemistry 300	Physics 300	
	Physical Science 300	Chemistry 300	Physics 300

Alternate Pathway (North Only)

Biology 200 → Physical Science 300 → Chemistry 300

Alternate Pathway (South Only)

Biology 200 → Physical Science 200 → Chemistry 300

**** Students may enroll in elective or AP science courses as Juniors if they are concurrently enrolled in Physics.***
All AP courses and science electives require a recommendation from the student's most recent science instructor.

BILINGUAL BIOLOGY 200 **(SOUTH CAMPUS ONLY)** Credit: 1 unit

Eligible Grade Level: 9, 10, 11, 12

Prerequisites: Students are enrolled in this course by special selection.

Bilingual Biology 200 is an introductory course in the life sciences. The curriculum maintains the content requirements for a District 99 Biology course and is organized at a more moderate pace, which is conducive to the success of Bilingual Biology 200 students. Scientific themes regarding biological systems, diversity among living things, energy, evolution, and human impact on our Earth systems will be highlighted throughout this course. This bilingual course utilizes modified materials and activities promoting language acquisition, science reading and quantitative reasoning to support students, who are not proficient in English, in the application of science and engineering practices and demonstration of scientific literacy. In addition, this course builds vocabulary and content concepts in both Spanish and English. This course is co-taught by a science teacher and bilingual teacher. Student materials are both in Spanish and English. Laboratory work is an integral and required part of the course.

BIOLOGY 200 Credit: 1 unit

Eligible Grade Level: 9, 10, 11, 12

Prerequisites: Students are enrolled in this course by special selection.

Biology 200 is an introductory course in the life sciences. The curriculum maintains the content requirements for a District 99 Biology course and is organized at a more moderate pace, which is conducive to the success of Biology 200 students. Scientific themes regarding biological systems, diversity among living things, energy, evolution, and human impact on our Earth systems will be highlighted throughout this course. The 200 level utilizes modified materials and activities to promote science reading and quantitative reasoning to support Biology 200 students in the application of science and engineering practices and demonstration of scientific literacy. Laboratory work is an integral and required part of the course.

BIOLOGY 300 Credit: 1 unit

Eligible Grade Level: 9, 10, 11, 12

Prerequisites: Recommendation of Junior High science teacher and special placement by Science Department Chair

Biology 300 is an introductory course in the life sciences, which is designed to be a college preparatory course. Scientific themes regarding biological systems, diversity among living things, energy, evolution, and human impact on our Earth systems will be highlighted throughout this course. Biology 300 students will be engaged in the application of science and engineering practices and are expected to demonstrate scientific literacy by participating in scientific discourse. Laboratory work is an integral and required part of the course.

BIOLOGY 400 HONORS Credit: 1 unit

Eligible Grade Level: 9, 10, 11, 12 Grade Weighted

Prerequisites: Recommendation of Junior High science teacher and special placement by Science Department Chair

Biology 400 is an accelerated introductory course in the life sciences which is intended to prepare students for future 400 (honors) level classes, advanced science classes and college level biology by providing a challenging learning environment in which the curriculum is organized at a more rigorous pace conducive to the success of all Biology 400 level students. Scientific themes regarding biological systems, diversity among living things, energy, evolution, and human impact on our Earth systems will be highlighted throughout this course. Biology 400 students will be engaged in the application of science and engineering practices and are expected to demonstrate scientific literacy by participating in scientific discourse. Laboratory work is an integral and required part of the course and is highly analytical in nature.

BIOLOGY II: RESEARCH QUESTIONS IN BIOLOGY Credit: 1 unit

Eligible Grade Level: 11, 12

Prerequisites: Completion of Biology and Chemistry. Completion of/or concurrent enrollment in Physics.

Biology II: Research Questions in Biology provides students with an opportunity to study new emerging issues in the biological sciences in a challenging learning environment. The course requires students to work individually and collaboratively to develop an understanding of the nature of science in order to answer biological questions dealing

with genetic engineering, forensic science, human health and environmental action among others. Biology II: Research Questions in Biology is a fourth year elective science option that provides a rigorous learning environment designed for college preparation. The course uses a student-centered instructional approach, with students using various technological tools to facilitate the problem-solving process. Real-world experiences provide authentic learning opportunities for students. Laboratory work is an integral and required part of the course and is highly analytical in nature.

ANATOMY AND PHYSIOLOGY Credit: 1 unit

Eligible Grade Level: 11, 12

Prerequisites: Completion of Biology, Chemistry. Completion of/ or concurrent enrollment in Physics.

Anatomy and Physiology is a fourth year elective science option that provides a challenging learning environment designed for college preparation. This course involves a detailed study of the structures and functions of major body systems, and is intended to prepare students for collegiate science classes. College level materials are used. The core topics covered in Anatomy and Physiology are: anatomical terminology, biochemistry, cytology, histology and body systems such as the skeletal, nervous, circulatory, endocrine, respiratory, digestive, urinary, and reproductive systems. Anatomy and Physiology provides a challenging learning environment in which the curriculum is organized at a more rigorous pace. Laboratory work is an integral and required part of the course. The course requires that students conduct physiological experiments and that anatomical study is aided by detailed dissection of a laboratory mammal.

AP BIOLOGY Credit: 1 unit

Eligible Grade Level: 11, 12 Grade Weighted

Prerequisites: Completion of Biology and Chemistry with a grade of "B" or better and completion of/or concurrent enrollment in Physics. Recommendation by a current science teacher is required.

AP Biology is designed to meet the objectives of a first-year college general biology course. College level materials are used and the curriculum is established by the National College Board. The core topics covered in AP Biology are: molecular biology, plant and animal biology, anatomy and physiology, genetics, ecology, and evolution. Preparatory work for this course will be assigned for students to complete during the summer prior to the school year of enrollment. Laboratory work is an integral and required part of the course and is highly analytical in nature.

Students should have an interest in the sciences along with a well-established work ethic for success in this college level course. AP Biology prepares the student to write, in May, a college level Examination of the National Advanced Placement Program (AP Biology). Success on this exam may entitle the student to college credit, advanced college placement, or both.

AP ENVIRONMENTAL SCIENCE Credit: 1 unit

Eligible Grade Level: 10, 11, 12 Grade Weighted

Prerequisites: Completion of/or concurrent enrollment in Physics. Sophomores concurrently enrolled in Chemistry 400 may be enrolled with department chair approval. Recommendation by a current science teacher is required.

AP Environmental Science is designed to meet the objectives of a one semester introductory college course in environmental science. College level materials are used and the curriculum is established by the National College Board. The goal of the course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships 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. Environmental science is an interdisciplinary course; embracing a wide variety of topics from different areas of study, yet is built around several major unifying ideas. The themes that provide the foundation for the structure of the AP Environmental Science course are: 1. Science is a process. 2. Energy conversions underlie all ecological processes. 3. The Earth itself is one interconnected system. 4. Humans alter natural systems. 5. Environmental problems have a cultural and social context. 6. Human survival depends on developing practices that will achieve sustainable systems. Field experiences and laboratory work are an integral and required part of the course and are highly analytical in nature.

Students should have an interest in the sciences along with a well-established work ethic for success in this college level course. AP Environmental Science prepares the student to write, in May, a college level Examination of the National Advanced Placement Program (AP Environmental Science). Success on this exam may entitle the student to college credit, advanced college placement, or both.

RESEARCH TOPICS IN EARTH SCIENCE Credit: 1 unit

Eligible Grade Level: 12

Prerequisites: Completion of Biology, Chemistry and Physics

Research Topics in Earth Science is a technology based research and data driven course that provides students with an opportunity to study earth system science. Earth as a system consists of geosphere, hydrosphere, atmosphere, and biosphere. Scientific disciplines that are traditionally grouped into the earth sciences are geology, meteorology, astronomy, and oceanography.

Research Topics in Earth Science is a fourth year elective science option that provides a challenging learning environment designed for college preparation. The core topics covered in Research Topics in Earth Science are: natural resources, fossil record, natural disasters, climate change and astronomy. Research skills developed in this class will prepare students for college work. Course work will require students to collect, organize, and analyze information to achieve a fuller understanding of the planet. Students will conduct research in the classroom, the laboratory, as well as in the field.

PHYSICAL SCIENCE 200 **(SOUTH CAMPUS ONLY)** Credit: 1 unit

Eligible Grade Level: 10, 11, 12

Prerequisites: Students are enrolled in this course by special selection.

Physical Science 200 is an introductory course in the physical sciences. The curriculum maintains the content requirements for a District 99 Physical Science course and is organized at a more moderate pace, which is conducive to the success of Physical Science 200 students. The core chemistry and physics topics covered in Physical Science 200 are: the scientific method, measurement, properties of matter, acids and bases, energy, forces, motion, sound, and light. The 200 level utilizes modified materials and activities. The course does not minimize the content requirements for a science course, but the curriculum includes support for science reading and quantitative reasoning. The 200 level utilizes modified materials and activities to promote science reading and quantitative reasoning to support Biology 200 students in the application of science and engineering practices and demonstration of scientific literacy. Laboratory work is an integral and required part of the course.

PHYSICAL SCIENCE 300 Credit: 1 unit

Eligible Grade Level: 10, 11, 12

Prerequisites: Completion of Biology and completion of or concurrent enrollment in Math I.

Physical Science 300 is an introductory course in the physical sciences. The core chemistry and physics topics covered in Physical Science 300 are: the scientific method, measurement, properties of matter, chemical reactions, energy, forces, and motion. The Physical Science 300 curriculum is designed to prepare students for Chemistry 300 and Physics 300. Physical Science 300 students will be engaged in the application of science and engineering practices and are expected to demonstrate scientific literacy by participating in scientific discourse. Laboratory work is an integral and required part of the course.

CHEMISTRY 300 Credit: 1 unit

Eligible Grade Level: 10, 11, 12

Prerequisites: Completion of Biology and completion of Math I with a grade of "C" or better.

Chemistry 300 is an introductory chemistry course that meets the District 99 Physical Science graduation requirement. This course is designed to be a college preparatory course. The core topics covered in Chemistry 300 are: dimensional analysis, matter, gas laws, stoichiometry, the mole, periodicity, reaction types, solutions, and thermochemistry. Chemistry 300 students will be engaged in the application of science and engineering practices and are expected to demonstrate scientific literacy by participating in scientific discourse. Laboratory work is an integral and required part of the course and is highly analytical in nature.

CHEMISTRY 400 HONORS Credit: 1 unit

Eligible Grade Level: 10, 11, 12 Grade Weighted

Prerequisites: Completion of Biology 300 or Biology 400 with a grade of "B" or better and completion of Math I with a grade of an "A".

Chemistry 400 is an accelerated introductory chemistry course that meets the District 99 Physical Science graduation requirement. This investigative course is designed to be a college preparatory course and is intended to prepare students for future 400(honors) level and advanced science classes and college level chemistry. The core topics covered in Chemistry 400 are: the nature science, the mole, chemical reactions, stoichiometry, kinetic molecular theory, solutions, thermodynamics, equilibrium, and acids & bases. Chemistry 400 provides a challenging learning environment in which the curriculum is organized at a more rigorous pace conducive to the success of Chemistry 400 students. The course stresses the inquiry method which aids students in discovering fundamental principles and uses the mathematics needed for college chemistry and other related fields. Chemistry 400 students will be engaged in the application of science and engineering practices and are expected to demonstrate scientific literacy by participating in scientific discourse. Laboratory work is an integral and required part of the course and is highly analytical in nature.

AP CHEMISTRY Credit: 1 unit

Eligible Grade Level: 11, 12 Grade Weighted

Prerequisites: Completion of Chemistry 300 or Chemistry 400 and completion of/or concurrent enrollment in Physics. Recommendation by a current science teacher is required. For those students who earned less than a B in Chemistry 400 or for those previously in Chemistry 300, there is additional support in the form of an AP Chemistry Summer Bridge course that is highly recommended in order to enhance a student's preparation for AP Chemistry.

AP Chemistry is designed to meet the objectives of a first-year college general chemistry course. College level materials are used and the curriculum is established by the National College Board. Preparatory work for this course will be assigned for students to complete during the summer prior to the school year in which they are enrolled in this course. Laboratory work is an integral and required part of the course and is highly analytical in nature.

Students should have an interest in the sciences along with a well-established work ethic for success in this college level course. AP Chemistry prepares the student to write, in May, a college level Examination of the National Advanced Placement Program (AP Chemistry). Success on this exam may entitle the student to college credit, advanced college placement, or both.

PHYSICS 300 Credit: 1 unit

Eligible Grade Level: 11, 12

Prerequisites: Completion of Chemistry and Math II and completion of/or concurrent enrollment in Math III.

Physics 300 is an introductory Physics course. This course is designed to be a college preparatory course. The core topics covered in Physics 300 are: kinematics, dynamics, energy, and electricity. Physics 300 students will be engaged in the application of science and engineering practices and are expected to demonstrate scientific literacy by participating in scientific discourse. Laboratory work is an integral and required part of the course and is highly analytical in nature.

PHYSICS 400 HONORS Credit: 1 unit

Eligible Grade Level: 11, 12 Grade Weighted

Prerequisites: Completion of Chemistry. Completion of/or concurrent enrollment in Math III and completion of/or concurrent enrollment in Math III Honors is strongly recommended.

Physics 400 is an accelerated introductory Physics course. This course is designed to be a college preparatory course and is intended to give the student a sufficient background in classical physics and prepare students for future 400(honors) level and advanced science classes and college level physics. The core topics covered in Physics 400 are: kinematics, dynamics, energy, and electricity. Physics 400 provides a challenging learning environment in which the curriculum is organized at a more rigorous pace conducive to the success of Physics 400 students. Physics 400 students will be engaged in the application of science and engineering practices and are expected to demonstrate scientific literacy by participating in scientific discourse. Laboratory work is an integral and required part of the course and is highly analytical in nature.

AP PHYSICS C: MECHANICS, ELECTRICITY AND MAGNETISM Credit: 1 unit

Eligible Grade Level: 12 Grade Weighted

Prerequisites: Completion of Physics 400 and Chemistry 400 with a grade of "B" or better recommended. Completion of/or concurrent enrollment in AB/BC Calculus is required. Recommendation by a current science teacher is required.

AP Physics is designed to meet the objectives of a first-year college general physics course. College level materials are used and the curriculum is established by the National College Board. This course in physics is designed to give students an in-depth study of classical physics at the university level. A minimal amount of calculus will be provided and used. Laboratory work is an integral and required part of the course and is highly analytical in nature.

Students should have an interest in the sciences along with a well-established work ethic for success in this college level course. AP Physics prepares the student to write, in May, <u>TWO</u> college level Physics Examinations of the National Advanced Placement Program (AP Physics C: Mechanics and AP Physics C: Electricity and Magnetism). Success on this exam may entitle the student to college credit, advanced college placement, or both.

AP PHYSICS C: MECHANICS Credit: 1 unit

Eligible Grade Level: 12 Grade Weighted

Prerequisites: Completion of Physics 400 or Physics 300. Recommendation by a current science teacher is required.

AP Physics is designed to meet the objectives of a first semester college physics course. College level materials are used and the curriculum is established by the National College Board. This course in physics is designed to give students an in-depth study of mechanics at the university level. Extended time will be devoted in this course to the study and practice of necessary mathematical techniques for college level physics. It is recommended that students have an interest in the sciences along with a well-established work ethic. Laboratory work is an integral and required part of the course and is highly analytical in nature.

Students should have an interest in the sciences along with a well-established work ethic for success in this college level course. AP Physics prepares the student to write, in May, a college level Physics Examination of the National Advanced Placement Program (AP Physics C: Mechanics). Success on this exam may entitle the student to college credit, advanced college placement, or both.