

Science

Beginning with the 2022-23 school year the Science graduation requirements will change for students. Course placement is determined by admissions test scores, teacher recommendation, and previous courses completed. Placement reevaluated based on academic progress.

CLASS OF 2023: *The graduation requirement is three years of science, including one year of Biology and one year of Chemistry.*

CLASS of 2024 and beyond: *All students must take one year of Biology, one year of Chemistry, and one year of Physics.*

Biology (YR)

Two semesters, two credits, required of freshmen.

This course examines the biological world with an emphasis on real-world applications. Topics covered will include cell biology, molecular basis of inheritance, and interdependence of organisms, living systems, and the behavior of organisms. Students will use technology in the classroom and be involved in many laboratory activities such as DNA gel electrophoresis, and fetal pig dissection.

Honors Biology (YR)

Two semesters, two credits.

Prerequisite: Recommendation from BSM junior high science department OR 85th percentile or higher on a standardized test science section; if no standardized test score is on file, the student must have earned an “A-” or better in both 7th and 8th grade science courses

Honors Biology is a rigorous course designed to challenge students who have a great curiosity and ability in science. The faster pace of this course covers the same material as the regular Biology course while allowing additional topics related to medicine and anatomy to be covered. Because of the faster pace, students will be expected to be hard workers, motivated learners, and able to grasp scientific concepts quickly.

General Chemistry (YR)

Two semesters, two credits, open to juniors.

Prerequisite: concurrent enrollment in Intermediate Algebra.

This laboratory-based course focuses on the key concepts of chemistry. Students will develop their problem-solving and critical thinking skills by collaborating on research projects and laboratory experiments. This course will focus on the following topics: measurement and the metric system, states of matter, atomic structure, kinetic molecular theory, mixtures and compounds, solutions, the periodic table, chemical formulas, chemical reactions, bonding, gas laws, and stoichiometry.

Chemistry (YR) *Two semesters, two credits, open to sophomores and juniors who meet the math requirement.*

Prerequisite: Completion of, or concurrent enrollment in, Algebra II or Honors Algebra II.

This course is intended for those students who seek a solid chemistry background in preparation for college or desire a complete understanding of chemistry principles. Students will study the structure, properties, and changes in matter as well as the laws, principles, and theories describing matter. Classroom activities will include lectures, demonstrations, problem solving, and experiments.

Honors Chemistry (YR)

Two semesters, two credits, open to sophomores and juniors who meet the math requirement.

Prerequisite: Completion of Algebra II or Honors Algebra II with at least an “A-” or concurrent enrollment in Honors Algebra II

Honors Chemistry is a rigorous course designed to challenge students who have a great curiosity and ability in science. Students should be self-motivated and enjoy challenges. Problem solving skills are very important. The faster pace of this course covers the same material as the regular Chemistry course while allowing additional topics to be covered. Because of the faster pace, students will be expected to be independent problem solvers, motivated learners, and able to grasp scientific concepts quickly.

General Physics (YR)

Two semesters, two credits, open to seniors.

Prerequisite: Recommendation from chemistry teacher

This project-based course gives students an introduction to physics and engineering. Students will learn fundamental science skills through which teamwork and cooperative learning will be emphasized. Topics covered will include measurement, the metric system, motion, forces, energy, and electricity. Activities will include projects, laboratory work, formal assignments, inquiry-based activities, lectures, and demonstrations.

Physics (YR)

Two semesters, two credits, open to juniors and seniors.

Prerequisite: Completion of, or concurrent enrollment in, Algebra II or Honors Algebra II.

This course is designed for students who have a natural curiosity about how the world works. Have you ever wondered why you get pushed to the outside of a car when going around a curve? Why do spaceships “slingshot” themselves past other planets? Why does your hair get more “static-y” during the winter? We’ll focus on topics like kinematics and motion, forces, energy, momentum, electricity, magnetism, waves, light, and sound. Through labs and engineering challenges, students will gain a better understanding of how the rules of nature can explain our everyday experiences. Students will complete lab assignments and 1-2 major projects. This course is designed for anyone who has an interest in science.

Science

Electives

Ecology (YR)

Two semesters, two credits, open to sophomores, juniors and seniors.

Ecology will provide hands-on, often outdoor, learning experiences through project-based problem-solving activities. Students will learn about the interrelationships of living things and their physical environments. Students will engage in the study of environmental topics affecting the world in which they live.

Forensic Science (YR)

Two semesters, two credits, open to sophomore, juniors, and seniors.

Are you intrigued by CSI? Does a statement like, “We’re not quite sure of the C.O.D but there is some GSR on our vic,” resonate with you? If so, this class might be for you! Forensic science is a challenging investigative course that applies scientific principles and technological practices from biology, chemistry, and physics for the purpose of justice. Some major themes of study include collecting physical evidence, glass and soil, fingerprints, hair and fiber, DNA typing, chemical analysis, sound waves, blood spatter analysis, entomology, casts, impressions, and tool marks. This is a year-long course that will require critical thinking, problem solving and an investigative and curious mind as we build upon these themes at an advanced level.

Biomedical Science I: Investigations (YR)

Two semesters, two credits.

Order of enrollment preference: sophomores, juniors, seniors.

Prerequisites: Completion of Biology with an “A-” or Honors Biology with a “B” or higher. A summer assignment is required and due the first day of school

This course is a hands-on, lab-oriented class designed for those students interested in medicine and medical technologies teaching them how the body works together to maintain health. Students will explore how the body works using Vernier technology, real life medical equipment, act as doctors to diagnose and treat fictitious patients, create, and present models of different systems/organs in the human body. Coursework includes dissections, and case studies, simulations, and guest speakers. The course will culminate with students exploring a disease from beginning to end and creating and presenting their own patient case study.

Advanced Placement

AP Biology (YR)

Two semesters, two credits, open to juniors and seniors

This course is eligible for PACC credit.

Prerequisite: Completion of Biology or Honors Biology; completion of Chemistry or Honors Chemistry.

This course is a second-year biology course, designed to be equivalent to an introductory biology course intended for biology majors during the first year of college. This course prepares students for the Advanced Placement exam in Biology. Students will explore major concepts in Biology, including cell structure and function, the cell cycle, DNA structure and function, principles of genetic inheritance, physiology and anatomy of animals and plants, biodiversity, ecology, and evolution.

Students should have a strong understanding of basic biology and chemistry concepts. Given the amount of material covered on the AP exam, the course will move at a quick pace.

AP Chemistry (YR)

Two semesters, two credits, open to juniors and seniors.

Prerequisite: Completion of Chemistry or Honors Chemistry.

This course is available for PACC credit. This course is a second-year chemistry course, designed to be the equivalent of the general course taken during the first year of college. This course prepares students for the Advanced Placement exam. It is structured around the six big ideas as described the AP Curriculum Framework: including the structure of matter, properties of matter, chemical reactions, the rates of chemical reactions, thermodynamics, and equilibrium. A special emphasis will be placed on the seven science practices, which capture important aspects of the work in which scientists engage. Learning objectives will combine content with inquiry and reasoning skills during multiple hands-on laboratory investigations.

AP Physics I (YR)

Two semesters, two credits, open to seniors.

Prerequisite: Completion of Precalculus or Precalculus Blended Online.

AP Physics I is an algebra-based, introductory college-level physics course. Students cultivate their understanding of Physics through inquiry-based investigations as they explore the topics of kinematics, dynamics, circular motion and gravitation, energy, momentum, simple harmonic motion, torque and rotational motion, electrical charge and force, DC circuits, and mechanical waves and sound.

Students should have a basic algebra background before enrolling in this course. Students should also plan to spend at least 25% of instructional time doing hands-on laboratory work, with an emphasis on inquiry-based investigations that allow opportunities to demonstrate foundational physics principles and apply important scientific practices.

Biomedical Science II: AP Seminar: (YR) *Two semesters, two credits. Open to juniors and seniors.*

Prerequisite: Biomedical Science I: Investigations. Students are required to complete a summer assignment due the first day of school.

AP Seminar: Biomedical Science is first and foremost a science class. Students will focus their efforts on using the processes of biomedical science to study current areas of debate such as: genetic engineering in humans, animal use in research, effectiveness of stem cell therapies, pandemic preparedness, and cell phone radiation. Using the AP framework, Q.U.E.S.T. (Question, Understand, Evaluate Perspectives, Synthesize Ideas, and Team, Transmit, and Transform), will allow students to look deeply and thoroughly at complex issues through multiple lenses. Each topic addressed will have a series of experiments focused on the biomedical aspect. These experiments and the accompanying research techniques will offer a jumping off point for more questions and answers. The College Board will ask students to engage in two Performance Tasks: one as a team, the other as an individual. Each of these has a multimedia portion and an individual writing assignment. This course prepares the student for the AP Exam in May. College credit may be earned as part of the AP Capstone program. (see page 6 for Capstone program information).

Science

Biomedical Science III: AP Research: (YR)

Two semesters, two credits.

Prerequisite: Completion of Biomedical Science II: AP Seminar.

Students will collaborate with other students, teachers, and/or professionals in their field of study to design and implement a research project or product. Students will focus on an area of personal interest in the biomedical field and study it in depth. Outcomes from the course may include publishing research findings, a professional poster symposium, participating in national research-related competitions, and/or an internship in the field. AP Research, the second course in the AP Capstone experience, allows students to deeply explore an academic topic, problem, issue, or idea of individual interest. Student's design, plan, and implement a yearlong investigation to address a research question. Through this inquiry, they further the skills they acquired in the AP Seminar course by learning research methodology, employing ethical research practices, and accessing, analyzing, and synthesizing information. Students reflect on their skill development, document their processes, and curate the artifacts of their scholarly work through a process and reflection portfolio. The course culminates in an academic paper of 4,000–5,000 words (accompanied by a performance, exhibit, or product where applicable) and a presentation with an oral defense.

College in Schools

BSM offers Combined Courses that allow students to learn about topics from multiple perspectives. For courses found below, they are being taught with an engineering teacher, as well as a teacher from the science department. You will also see these course listings shown on that department's program of studies page.

Climate Crisis: Implementing Solutions (S1 or S2) A course offered through CIS

Prerequisite: B or better in Biology or Chemistry AND a B or better in Algebra 2 or Precalculus.

One semester, one credit, open to juniors and seniors.

The earth's changing climate due to human-generated greenhouse gas emissions poses major challenges to our society in the years ahead. This course is designed to provide students with a fundamental understanding of the threat posed by climate change and the technologies available to combat this threat. Topics to be covered include energy from renewables such as solar and wind to combat potentially catastrophic climate change resulting from our use of fossil fuels; electrifying our transportation; ways to increase energy efficiency and energy conservation; need for energy storage to increase the penetration of renewables; role of technology, societal benefits, and the ethics.