



Kansas Board of Regents
Precollege Curriculum Courses Approved for University Admissions

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Revision Dates

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The precollege curriculum is designed to prepare high school students for university-level work. The list of courses fulfilling the precollege curriculum has been recommended by the Kansas State Department of Education and approved by the chief executive officer of the board of regents or the chief executive officer's designee. Requirements for the precollege curriculum are found in K.A.R. 88-29-11 and 88-29a-11.

NATURAL SCIENCE Course Title	Course Code	Course Subject Area	Course Description
Earth Science	03001	03	Earth Science courses offer insight into the environment on earth and the earth's environment in space. While presenting the concepts and principles essential to students' understanding of the dynamics and history of the earth, these courses usually explore oceanography, geology, astronomy, meteorology, and geography.
Geology	03002	03	Geology courses provide an in-depth study of the forces that formed and continue to affect the earth's surface. Earthquakes, volcanoes, and erosion are examples of topics that are presented.
Environmental Science	03003	03	Environmental Science courses examine the mutual relationships between organisms and their environment. In studying the interrelationships among plants, animals, and humans, these courses usually cover the following subjects: photosynthesis, recycling and regeneration, ecosystems, population and growth studies, pollution, and conservation of natural resources.
Astronomy	03004	03	Astronomy courses offer students the opportunity to study the solar system, stars, galaxies, and interstellar bodies. These courses usually introduce and use astronomic instruments and typically explore theories regarding the origin and evolution of the universe, space, and time.
Marine Science	03005	03	Courses in Marine Science focus on the content, features, and possibilities of the earth's oceans. They explore marine organisms, conditions, and ecology and sometimes cover marine mining, farming, and exploration.

Meteorology	03006	03	Meteorology courses examine the properties of the earth's atmosphere. Topics usually include atmospheric layering, changing pressures, winds, water vapor, air masses, fronts, temperature changes and weather forecasting.
Earth and Space Science	03008	03	Earth and Space Science courses introduce students to the study of the earth from a local and global perspective. In these courses, students typically learn about time zones, latitude and longitude, atmosphere, weather, climate, matter, and energy transfer. Advanced topics often include the study of the use of remote sensing, computer visualization, and computer modeling to enable earth scientists to understand earth as a complex and changing planet.
Biology	03051	03	Biology courses are designed to provide information regarding the fundamental concepts of life and life processes. These courses include (but are not restricted to) such topics as cell structure and function, general plant and animal physiology, genetics, and taxonomy.
Biology—Advanced Studies	03052	03	Usually taken after a comprehensive initial study of biology, Biology—Advanced Studies courses cover biological systems in more detail. Topics that may be explored include cell organization, function, and reproduction; energy transformation; human anatomy and physiology; and the evolution and adaptation of organisms.
Anatomy and Physiology	03053	03	Usually taken after a comprehensive initial study of biology, Anatomy and Physiology courses present the human body and biological systems in more detail. In order to understand the structure of the human body and its functions, students learn anatomical terminology, study cells and tissues, explore functional systems (skeletal, muscular, circulatory, respiratory, digestive, reproductive, nervous, and so on), and may dissect mammals.
Anatomy	03054	03	Anatomy courses present an in-depth study of the human body and biological system. Students study such topics as anatomical terminology, cells, and tissues and typically explore functional systems such as skeletal, muscular, circulatory, respiratory, digestive, reproductive, and nervous systems.

Physiology	03055	03	Physiology courses examine all major systems, tissues, and muscle groups in the human body to help students understand how these systems interact and their role in maintaining homeostasis. These courses may also cover such topics as cell structure and function, metabolism, and the human life cycle.
AP Biology	03056	03	Adhering to the curricula recommended by the College Board and designed to parallel collegelevel introductory biology courses, AP Biology courses stress basic facts and their synthesis into major biological concepts and themes. These courses cover three general areas: molecules and cells (including biological chemistry and energy transformation); genetics and evolution; and organisms and populations (i.e., taxonomy, plants, animals, and ecology). AP Biology courses include college-level laboratory experiments.
IB Biology	03057	03	IB Biology courses prepare students to take the International Baccalaureate Biology exams at either the Subsidiary or Higher level. In keeping with the general aim of IB Experimental Sciences courses, IB Biology promotes understanding of the facts, principles, and concepts underlying the biological field; critical analysis, evaluation, and generation of scientific information and hypotheses; improved ability to communicate scientific ideas; and an awareness of the impact of biology and scientific advances in biology upon both society and issues of ethical, philosophical, and political importance. Course content varies, but includes study of living organisms from the cellular level through functioning entities within the biosphere. Laboratory experimentation is an essential component of these courses.
Botany	03058	03	Botany courses provide students with an understanding of plants, their life cycles, and their evolutionary relationships.

Genetics	03059	03	Genetics courses provide students with an understanding of general concepts concerning genes, heredity, and variation of organisms. Course topics typically include chromosomes, the structure of DNA and RNA molecules, and dominant and recessive inheritance and may also include lethal alleles, epistasis and hypostasis, and polygenic inheritance.
Microbiology	03060	03	Microbiology courses provide students with a general understanding of microbes, prokaryotic and eukaryotic cells, and the three domain systems. Additional topics covered may include bacterial control, cell structure, fungi, protozoa, viruses and immunity, microbial genetics, and metabolism.
Zoology	03061	03	Zoology courses provide students with an understanding of animals, the niche they occupy in their environment or habitat, their life cycles, and their evolutionary relationships to other organisms. These courses should also help students develop an awareness and understanding of biotic communities.
Chemistry	03101	03	Chemistry courses involve studying the composition, properties, and reactions of substances. These courses typically explore such concepts as the behaviors of solids, liquids, and gases; acid/base and oxidation/reduction reactions; and atomic structure. Chemical formulas and equations and nuclear reactions are also studied.
Chemistry—Advanced Studies	03102	03	Usually taken after a comprehensive initial study of chemistry, Chemistry—Advanced Studies courses cover chemical properties and interactions in more detail. Advanced chemistry topics include organic chemistry, thermodynamics, electrochemistry, macromolecules, kinetic theory, and nuclear chemistry.
Organic Chemistry	03103	03	Organic Chemistry courses involve the study of organic molecules and functional groups. Topics covered may include nomenclature, bonding molecular structure and reactivity, reaction mechanisms, and current spectroscopic techniques.

Physical Chemistry	03104	03	Usually taken after completing a calculus course, Physical Chemistry courses cover chemical kinetics, quantum mechanics, molecular structure, molecular spectroscopy, and statistical mechanics.
AP Chemistry	03106	03	Following the curricula recommended by the College Board, AP Chemistry courses usually follow high school chemistry and second-year algebra. Topics covered may include atomic theory and structure; chemical bonding; nuclear chemistry; states of matter; and reactions (stoichiometry, equilibrium, kinetics, and thermodynamics). AP Chemistry laboratories are equivalent to those of typical college courses.
IB Chemistry	03107	03	IB Chemistry courses prepare students to take the International Baccalaureate Chemistry exams at either the Subsidiary or Higher level. In keeping with the general aim of IB Experimental Sciences courses, IB Chemistry promotes understanding of the facts, patterns, and principles underlying the field of chemistry; critical analysis, evaluation, prediction, and generation of scientific information and hypotheses; improved ability to communicate scientific ideas; and an awareness of the impact of chemistry and scientific advances in chemistry upon both society and issues of ethical, philosophical, and political importance. Course content varies, but includes the study of the materials of the environment, their properties, and their interaction. Laboratory experimentation is an essential part of these courses.
Physics	03151	03	Physics courses involve the study of the forces and laws of nature affecting matter, such as equilibrium, motion, momentum, and the relationships between matter and energy. The study of physics includes examination of sound, light, and magnetic and electric phenomena.

Physics—Advanced Studies	03152	03	Usually taken after a comprehensive initial study of physics, Physics—Advanced Studies courses provide instruction in laws of conservation, thermodynamics, and kinetics; wave and particle phenomena; electromagnetic fields; and fluid dynamics.
Principles of Technology	03153	03	Principles of Technology courses focus on the study of the forces and laws of nature and their application to modern technology. Equilibrium, motion, momentum, energy conversion, electromagnetism, and optical phenomena are presented in the context of current, real-world applications. Demonstrations, math labs, and applied laboratory experiments are an integral part of the Principles of Technology curriculum. These courses enable students to gain a solid foundation for careers in electronics, robotics, telecommunications, and other technological fields.
AP Physics B	03155	03	AP Physics B courses are designed by the College Board to parallel college-level physics courses that provide a systematic introduction to the main principles of physics and emphasize problemsolving without calculus. Course content includes mechanics, electricity and magnetism, modern physics, waves and optics, and kinetic theory and thermodynamics.
AP Physics C	03156	03	Designed by the College Board to parallel college-level physics courses that serve as a partial foundation for science or engineering majors, AP Physics C courses primarily focus on 1) mechanics and 2) electricity and magnetism, with approximately equal emphasis on these two areas. AP Physics C courses are more intensive and analytical than AP Physics B courses and require the use of calculus to solve the problems posed.

IB Physics	03157	03	<p>IB Physics courses prepare students to take the International Baccalaureate Physics exams at either the Subsidiary or Higher level. In keeping with the general aim of IB Experimental Sciences courses, IB Physics promotes understanding of the facts, patterns, and principles underlying the field of physics; critical analysis, prediction, and application of scientific information and hypotheses; improved ability to communicate scientific ideas; and an awareness of the impact of scientific advances in physics upon both society and issues of ethical, philosophical, and political importance. Course content varies, but includes the study of the fundamental laws of nature and the interaction between concepts of matter, fields, waves, and energy. Laboratory experimentation is essential; calculus may be used in some courses.</p>
Physical Science	03159	03	<p>Physical Science courses involve study of the structures and states of matter. Typically (but not always) offered as introductory survey courses, they may include such topics as forms of energy, wave phenomenon, electromagnetism, and physical and chemical interactions.</p>
IB Physical Science	03160	03	<p>IB Physical Science courses prepare students to take the International Baccalaureate Physical Science exams at either the Subsidiary or Higher level. These courses integrate the study of physics and chemistry, showing how the physical and chemical properties of materials can be explained and predicted in terms of atomic, molecular, and crystal structures and forces. In keeping with the general aim of IB Experimental Sciences courses, IB Physical Science courses promote critical analysis, prediction, and application of scientific information and hypotheses; improved ability to communicate scientific ideas; and an awareness of the impact of science and scientific advances upon both society and issues of ethical, philosophical, and political importance. Students are required to develop and pursue an individual, experimental project, which is evaluated as part of the IB exam.</p>

Integrated Science	03201	03	<p>The specific content of Integrated Science courses varies, but they draw upon the principles of several scientific specialties—earth science, physical science, biology, chemistry, and physics—and organize the material around thematic units. Common themes covered include systems, models, energy, patterns, change, and constancy. These courses use appropriate aspects from each specialty to investigate applications of the theme.</p>
IB Design Technology	03206	03	<p>IB Design Technology courses prepare students to take the International Baccalaureate Design Technology exams at either the Subsidiary or Higher level. In keeping with the general aim of IB Experimental Sciences courses, IB Design Technology courses promote understanding and use of the scientific method to solve problems using scientific information and production techniques. Practical/investigative work centers on the properties of materials, mechanisms, control circuits, and production techniques as they apply to constructing an artifact or developing skills and ideas useful in carrying out such a project.</p>
AP Environmental Science	03207	03	<p>AP Environmental Science courses are designed by the College Board to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, identify and analyze environmental problems (both natural and human made), evaluate the relative risks associated with the problems, and examine alternative solutions for resolving and/or preventing them. Topics covered include science as a process, ecological processes and energy conversions, earth as an interconnected system, the impact of humans on natural systems, cultural and societal contexts of environmental problems, and the development of practices that will ensure sustainable systems.</p>

IB Environmental Science	03208	03	<p>IB Environmental Systems courses prepare students to take the International Baccalaureate Environmental Systems exam at the Standard level by providing them with the knowledge, methods, and techniques to understand the nature and functioning of natural systems, the relationships that affect environmental equilibrium, and human impact on the biosphere. Topics also include ecosystem integrity and sustainability, students' own relationships to the environment, and the nature of internationalism in resolving major environmental issues.</p>
Aerospace	03209	03	<p>Aerospace courses explore the connection between meteorology, astronomy, and flight across and around the earth as well as into outer space. In addition to principles of meteorology (e.g., atmosphere, pressures, winds and jet streams) and astronomical concepts (e.g., solar system, stars, and interplanetary bodies), course topics typically include the history of aviation, principles of aeronautical decision-making, airplane systems, aerodynamics, and flight theory.</p>
Scientific Research and Design	03212	03	<p>In Scientific Research and Design courses, students conceive of, design, and complete a project using scientific inquiry and experimentation methodologies. Emphasis is typically placed on safety issues, research protocols, controlling or manipulating variables, data analysis, and a coherent display of the project and its outcome(s).</p>