SCIENCE

H = Honors Course

CC = College Credit

KR = Not included in the Qualified Admissions Approved Curriculum for KS Regents Universities because the course is a higher level and the requirement has been met by the prerequisite.

The sciences relate the study of the natural world through observation. St. Thomas Aquinas, Patron Saint of Students, was a student of St. Albert the Great, Patron Saint of Science, providing a unique opportunity for integration of faith and reason into the classroom content through historical connections. The curriculum is based upon Next Generation Science Standards adopted by the State of Kansas in accordance with the Saint Thomas Aquinas High School mission statement and Catholic faith.

Content knowledge is developed through strategies that incorporate varied assessments in critical literacy, analytical analysis, and modeling for explaining observations in the life and physical sciences. Practices are built around an inquiry-based learning environment for creative and collaborative opportunities so each student may be a contributing member of the learning community. Meaningful learning outcomes for furthering student interest and study are an important value of the curriculum.

Laboratory technology is used as a tool in conjunction with the BYOD school policy for activating student interest and increasing productivity both inside and outside the classroom.

Three years of science are required by the State of Kansas, based on a typical sequence of Biology (Honors/Regular), Chemistry 1 (Honors/Regular), and Physics 1 (Honors/Regular). Students who complete the required sequence in the first three years are provided options to develop further their interests and may choose from College Biology, Honors Chemistry 2, Honors Physics 2, Honors Anatomy/Physiology and Forensic Science. Prerequisites help students select the appropriate class placement. Senior level science courses and curriculum are structured through advanced college level texts and lab activities that model college.

BIOLOGY

Credit: 1 Grades 9

Course #: 060121

Prerequisite: None

Biology is the scientific study of life. This course is an introduction to the understanding of living organisms and vital processes in conjunction with the appreciation of life. Content includes the study of inheritance, history of life, microbes, plants, animal diversity and ecology.

HONORS BIOLOGY

Credit: 1 Grades 9

Course #: 060110

Prequisite: Concurrent enrollment in H English 9 & recommended H Algebra 1 or higher

Biology is the scientific study of life. This course strives for an in-depth understanding of living organisms, including bacteria, plants, and animals, and the processes vital to life, along with appreciation of life. Honors biology is a fast-paced, rigorous course that incorporates laboratory work and technology to enhance student learning.

PHYSICAL SCIENCE

Credit:1 Grade 10

Course #: 060341

Prerequisite: Biology and teacher recommendation

This course is a study of fundamental physics and chemistry principles. It provides a foundation for future science courses while encouraging problem-solving and study skills, as well as organizational and class time management skills. Students will be observing, measuring, classifying, interpreting data, graphing and forming conclusions through lab-based activities and demonstrations.

SCIENCE

Course Number	Course Name	Possible Grade Level 9	10	11	12	Credit	Dual-Enrollment	Weighted Grade
060121	Biology	■				1.0		
060110	Honors Biology	■				1.0		■
060341	Physical Science		■			1.0		
060221	Chemistry 1		■	■	■	1.0		
060201	Honors Chemistry 1		■	■	■	1.0		■
060405	Chemistry 2				■	0.5		
060800	AP Chemistry			■	■	1.0		■
060321	Physics 1			■	■	1.0		
060810	AP Physics 1			■	■	1.0		■
060505	Honors Physics 2				■	0.5		■
060401	Honors College Biology			■	■	1.0	■	■
060425	Honors Anatomy & Physiology			■	■	0.5		■
060430	Forensic Science			■	■	0.5		
060535	Zoology			■	■	0.5		
060700	Nursing Explorations (Sem 1)			■	■	0.5	■	
060710	Introduction to Health Professions (Sem 2)			■	■	0.5	■	

CHEMISTRY 1

Credit: 1 Grades 10-12

Course #: 060221

Prerequisites: 86% or above in Biology or 80% or above in Honors Biology

Chemistry is the science that deals with the structure and properties of matter and the changes that occur. This course is designed to acquaint students with scientific methodology and to provide a quantitative and qualitative approach to the understanding of matter and energy. This is done in accordance with the NGSS guidelines and will cover a variety of topics including: periodic law, atomic structure, chemical bonds and stoichiometry. Special emphasis is placed on problem solving and using mathematical skills. Newly acquired chemistry knowledge is applied to everyday life. Regular lab exercises are an important part of this course.

HONORS CHEMISTRY 1 H

Credit: 1 Grades 10-12

Course #: 060201

Prerequisite: 86% or higher in H Biology and Honors Algebra 1 or 94% or higher in Biology and Algebra 1

This course introduces students to chemical concepts by relating the structure of matter to its function, periodic law, energy exchanges in chemical reactions, and electromagnetic radiation. Topics are covered in a more in-depth mathematically- oriented manner than Chemistry I. Student-centered laboratory and computer investigations provide students with a variety of ways to develop models, interpret information, analyze data and develop critical thinking skills in accordance with the NGSS guidelines.

SCIENCE

CHEMISTRY 2

Credit: ½ Sem 1 only Grades 12

Course #: 060405

Prerequisite: Successful completion of Chemistry 1

Chemistry 2 builds upon the foundational principles introduced in Chemistry 1, offering students an opportunity to deepen their understanding of essential chemical concepts. This course reviews critical topics from introductory chemistry, including compounds, chemical formulas, reactions, and stoichiometry, ensuring students gain a strong grasp of these fundamental ideas.

Students will explore a wide range of chemical reactions, enhance their skills in balancing chemical equations, and apply stoichiometric relationships to solve complex quantitative problems. Throughout the course, emphasis will be placed on the practical application of chemical concepts through lab experiments and hands-on activities. This will allow students to reinforce their theoretical knowledge, critically analyze data, and draw meaningful conclusions.

By the end of Chemistry 2, students will have a comprehensive understanding of the core principles that govern chemical interactions, equipping them for more advanced studies in chemistry or related scientific fields.

AP CHEMISTRY

Credit: 1 Grades 11-12

Course #: 060800

Prerequisite: successful completion of Honors Chemistry 1 or a minimum grade of 90% in Chemistry 1 and concurrent enrollment in Honors Algebra 2 or higher.

AP Chemistry is equivalent to a college-level general chemistry course. The AP Chemistry course provides students with a college-level foundation to support future advanced coursework in chemistry. Students cultivate their understanding of chemistry through inquiry-based investigations,as they explore content such as:

Atomic Structure and Properties, Compound Structure and Properties, Properties of Substances and Mixtures, Chemical Reactions, Kinetics, Thermochemistry, Equilibrium, Acids and Bases, Thermodynamics and Electrochemistry. This course requires that 25 percent of instructional time be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to demonstrate the foundational chemistry principles and apply the science practices.

College credit may be earned for students who choose to take the AP test in May.

PHYSICS 1

Credit: 1 Grades 11-12

Course #: 060321

Prerequisite: Successful completion of Biology and Chemistry or Physical Science

Physics is the study of the fundamental laws of nature related to matter and energy. This course is an introductory course for the study of the classical Physics for explaining the natural world that surrounds us. Content includes kinematics, mechanics, wave theory, sound, light, and electricity. Basic analytical skills along with practices to develop critical literacy for applying the laws of Physics are incorporated into varied assessments for development of content knowledge. The course includes hands on laboratory activities for development of understanding use 2D to 3D modeling for meaningful learning opportunities utilizing NGSS guidelines.

AP PHYSICS 1 H

Credit: 1 Grades 11-12

Course # 060810

Prerequisite: Concurrent enrollment in AP Precalculus or higher math

AP Physics1 is equivalent to the first course in an introductory college course sequence in algebra-based physics. AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics by developing models of physical phenomena through inquiry-based investigations. Students build their understanding of physical models as they explore and solve problems in these content areas: Kinematics, Forces and Translational Dynamics, Work, Energy, and Power, Linear Momentum, Torque and Rotational Dynamics, Energy and Momentum of Rotating Systems, Oscillations, Fluids. This course requires that 25 percent of instructional time be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to demonstrate the foundational physics principles and apply the science practices.

College credit may be earned for students who choose to take the AP test in May.

SCIENCE

HONORS PHYSICS 2 H

Credit: ½ Grade 12

Course #: 060505

Prerequisite: Successful completion of Biology, Chemistry, Physics and Algebra 2; concurrent enrollment in College Algebra or higher is suggested (honors courses preferred and advised) with the grade of 86% or better.

Recommended cumulative GPA 90%

Physics is the study of the fundamental laws of nature related to matter and energy. This course connects prior knowledge from Physics I with new content and greater depth in the study in electricity, magnetism, heat, and light. The course adds greater depth into analytical reasoning and use of laboratory technology for modeling laws related to content. Both engineering and scientific practices are used for connecting content to meaningful learning opportunities and provide students the opportunity to explore further educational study in the sciences.

HONORS COLLEGE BIOLOGY H, CC

Credit: 1 Grade 11-12

Course #: 060401 JCCC BIOL 135

Prerequisite (senior): Successful completion of Biology and Chemistry. (junior): Teacher recommendation

Recommended GPA 90% and concurrent enrollment in College Algebra or higher

Honors College Biology is an introductory college biology class that integrates lecture and laboratory. This year-long class is fast-paced and rigorous with five-unit tests per semester and a final exam. Subjects covered include basic biochemistry, cell structure and function, cellular metabolism, Mendelian inheritance, natural selection and evolution, cell physiology, and development of plants and animals from the single-celled stage to the embryonic stage.

NOTE: Current tuition at JCCC is assessed if college credit is desired. Students may sign up for 4 hours JCCC credit.

HONORS ANATOMY/ PHYSIOLOGY H

Credit: ½ Grade 11-12

Course #: 060425

Prerequisite: Successful completion of Biology and Chemistry.

Recommended GPA 90% and concurrent enrollment of College Algebra or higher

This course is designed for students contemplating careers in a medical profession. Structure and function of the systems of the human body are explored. Regular classroom work is enhanced with laboratory activities, including small animal dissection. Careers utilizing anatomy and physiology are introduced. Units covered include skeletal, excretory, digestive, circulatory, nervous, respiratory and reproductive systems.

FORENSIC SCIENCE

Credit: ½ Grade 11-12

Course #: 060430

Prerequisites: successful completion of Biology, Chemistry, and either Physical Science or Physics.

Forensic science will introduce students to the basics of forensic science. This course offers extensive laboratory experience that integrates the concepts learned in biology, chemistry and physics to strengthen individual skills in scientific reasoning and observation. Using inquiry based settings, students will learn basic scientific and mathematical methods and models required in forensic science. Topics including: history, physical evidence, legal aspects, death investigation, fingerprinting, DNA analysis and trace evidence. Students will perform a wide range of forensic science techniques.

ZOOLOGY

Credit: ½ Grade 11-12

Course: 060535

Prerequisite: successful completion of Biology

Zoology is a semester-based course that will survey the major phyla of the animal kingdom. Zoology will build on and enhance your knowledge of all animal life forms from single celled organisms to complex mammals such as yourself. The course will include but is not limited to the topics of cell structures, ecology, reproduction, classification, and evolution across the nine different animal phyla. This course will use a variety of teaching techniques including debate/discussion, research, lecture, lab, and modeling.

SCIENCE

NURSING EXPLORATION CC

Credit: ½ (Sem 1) Grade 11-12

Course #: 060700

Prerequisite: Must be a Junior or Senior with an 85% or higher GPA. Students must enroll for college credit.

Nursing Exploration is designed for students to discover and examine the nursing profession, including specific roles and responsibilities. Students will investigate diverse professional opportunities, professional standards, and competencies. Students will develop a foundation for essential knowledge and skills including professional mentoring and networking to promote success as a nursing student. Course content will be presented in a hybrid format, including didactic instruction, skills labs, and simulation experiences in both on-site and off-site locations. The course will be taught by Nursing faculty from St. Luke's College of Nursing at Rockhurst University and moderated by a faculty member at Saint Thomas Aquinas High School.

INTRODUCTION TO HEALTH PROFESSIONS CC

Credit: ½ (Sem 2) Grade 11-12

Course #: 060710

Prerequisite: Must be a Junior or Senior with an 85% or higher GPA. Students must enroll for college credit through Rockhurst University.

This course provides an overview of health sciences and careers in health care related fields. Students explore relevant health professions and requirements for job and market demands in health sciences through an interprofessional lens. Through the introduction of a broad scope of current issues in health care, students evaluate the circumstances and path for their professional education and future career. Topics such as disability, community health, world health, and health care policies are considered.