

SCIENCE DEPARTMENT

Course	Grade	Prerequisite
Biology Requirement - 2 credits		
Biology I	9	None
Biology I – Honors	9	None
Physical Science Requirement - 2 or more credits		
Chemistry I	10-12	Algebra I, Honors Biology or Biology I
Honors Chemistry I	10-12	Recommended Honors Biology, Algebra I
Integrated Chemistry-Physics	10-12	Algebra 1
Physics I	10-12	Biology 1
Dual Credit AP Physics 1	11-12	Algebra II and Geometry
Other Science Courses		
Anatomy & Physiology	10-12	Biology I
Earth & Space Science I	10-12	Biology I
Biology II/ Zoology	10-12	Biology I
Bioethics and the Biology of Happiness	11-12	Biology I
Dual Credit/ AP Biology	11-12	Biology I and Chemistry
Dual Credit/ AP Chemistry	11-12	Algebra II and Chemistry (Honors Chem recommended)
Dual Credit Introductory Chemistry	11-12	Chem I, Concurrent enrollment in Algebra II, Students who plan to major in science are encouraged to take Dual Credit/ AP Chemistry.
Forensic Science	11-12	Recommended Chemistry or ICP
AP Environmental Science	11-12	Biology and Chemistry I
Science Research	11-12	Honors Biology or Biology I
Dual Credit/ AP Physics 2	11-12	AP Physics I, concurrent with Pre-Calculus

Students are encouraged to enroll in biology, chemistry, and physics as a basis for their science success in post-secondary education and in all careers. Additional AP courses are encouraged as well as electives that may suit a particular area of interest.

[Science Courses Slideshow](#)

Biology Requirement - 2 credits

Biology I

2 Semesters/2 Credits

Grade 9

Prerequisite - None

Biology is an introductory course designed to study living organisms and their physical environment. Students should apply scientific methods of inquiry and research in examining the following areas: biochemistry, cell structure, function and reproduction, cell energy, molecular basis of genetics, natural selection and diversity, and ecology. This course is required for graduation.

Biology I – Honors

2 Semesters/2 Credits

Grade 9

Prerequisite – A or B average in 8th grade science

Honors Biology is designed for students who have excellent reading, comprehension, and study skills. The pace in the course is rapid, and critical thinking is stressed. Biology is a laboratory/project-based course designed to study living organisms and their physical environment. Students should apply scientific methods of inquiry and research in examining the following topics: biochemistry, cell structure and function, cell energy, molecular basis of genetics, natural selection and diversity, and ecology. This course is required for graduation.

Physical Science Requirement - 2 credits

Chemistry I

2 Semesters/2 Credits

Grades 10-12

Prerequisite – Algebra I, Honors Biology or Biology I

Please consult with your current science teacher for best science course placement.

Chemistry I is designed primarily for the college bound student. It is a mathematics and laboratory based science class that covers topics such as atomic structure, chemical reactions, stoichiometry, solutions, gas laws, and acids and bases. Proficiency in Algebra I skills is required and more advanced mathematics is strongly recommended.

Honors Chemistry I

2 Semesters/2 Credits

Grades 10-12

Prerequisite – Biology, Recommended Honors Biology, Algebra I

Please consult with your current science teacher for the best science course placement.

Honors Chemistry I is designed primarily for the self-motivated student with strong reading comprehension, critical thinking, and study skills. It is a rapid-paced mathematics and laboratory based science class that utilizes inquiry to cover topics such as atomic structure, chemical reactions, stoichiometry, solutions, gas laws, and acids and bases. Proficiency in Algebra I skills is required and more advanced mathematics is strongly recommended.

Integrated Chemistry – Physics

2 Semesters/2 Credits

Grades 10-12

Prerequisite - Algebra I

Please consult with your current science teacher for best science course placement.

Integrated Chemistry/Physics introduces the fundamental concepts of scientific inquiry, the structure of matter, chemical reactions, forces, motion, and the interactions between energy and matter. This course is a laboratory-based introduction to possible future coursework in chemistry or physics that will ensure mastery of the basics of each discipline. First semester focuses on chemistry concepts. Physics concepts will be explored in the second semester. Students who passed Chemistry or Physics are not eligible to take this course.

Physics I

2 Semesters/2 Credits

Grades 10-12

Prerequisite – Biology (Chemistry recommended)

Please consult with your current science teacher for best science course placement.

Physics is the search for the fundamental laws that govern the behavior of objects in the universe. It's about the nature of basic things such as motion, forces, energy, matter, electricity, magnetism, and the composition of atoms. The emphasis will be on developing a conceptual understanding of these laws and phenomena. The course will give the students a deeper appreciation for the beauty of the natural world as revealed by modern science.

2 Semesters/2 Credits

Dual Credit AP Physics I

Grades 11-12

Prerequisite – Algebra II and Geometry – Please consult with your current science teacher for best science course placement.

This course is the equivalent of a first-semester college course in algebra-based physics. The course covers Newtonian mechanics, work, energy, power, and mechanical waves and sound. It also includes heat and thermodynamic principles and fluid dynamics for the Ivy Tech Physics 101 credit. Through inquiry-based learning, students will develop scientific critical thinking and reasoning skills. Students signing up for this class are required to take the AP exam in May. If students take the Algebra-Pre-Calc exam they may sign up and take Dual Credit with Physics 101 at Ivy Tech. The Knowledge Assessment from Ivy Tech for precalculus is a prerequisite for dual credit at Ivy Tech.

Other Science Courses

Anatomy & Physiology

2 Semesters/2 Credits

Grades 10-12

Prerequisite – Biology – Please consult with your current science teacher for best science course placement

Students will investigate and apply concepts associated with human anatomy and physiology. Concepts covered include the process of homeostasis and the essentials of human function at the level of genes, cells, tissues, and organ systems. Students will understand the structure, organization, and function of the various components of the healthy human body in order to apply this knowledge in all health-related fields. Animal dissection is included as part of the laboratory component of the course.

Earth & Space Science

2 Semesters/2 Credits

Grades 10-12

Prerequisite - None

This course is designed to help students explore the world and universe around them. Students will master a wide variety of Earth Science topics including meteorology (atmosphere, weather, storms), geology (minerals, rocks, plate tectonics, volcanoes, and earthquakes), astronomy (sun/Earth/moon, planets, stars and galaxies). Students analyze and describe Earth's interconnected systems and examine how Earth's materials, landforms, and continents are modified throughout time. Labs and hands-on activities will help students relate science to everyday life.

Biology II/Zoology

2 Semesters/2 Credits

Grades 10-12

Prerequisite-Biology, Please consult with your current science teacher for best science course placement

This course will explore the diversity and evolution of the ten major phyla of the animal kingdom. The primary focus will be a systematic study of the animal phyla to provide students with an understanding of the interaction between structure and function and an understanding of the evolutionary advancements exhibited by each phylum. The course will be a mixture of lectures, dissections, and labs. Class activities and laboratories will include fourteen different animal dissections, regeneration of planaria, animals and human diseases, ecology and biodiversity studies, and physiological studies of animals. This course would be great for sophomores, juniors, or seniors who enjoyed biology, are considering vet or medical school, or are looking for a fun, interactive science!

Bioethics and the Biology of Happiness

2 Semesters/2 Credits

Grade 11 - 12

Prerequisite - Biology I - Please consult with your current science teacher for best science course placement.

The first semester covers the biology of happiness. This portion of the course studies the physiological underpinnings of the psychological experience of happiness. The course is split into theory and practice. In regard to theory, students learn how the body is built and operates, from the ground up. Students learn how what people eat becomes incorporated into human bodies, how the body is built and operates, and how the nervous and endocrine systems work together to create thought and emotion. Students learn how humans get to the point of thinking and feeling.

The other main component to the study of happiness is practice. After learning about the physiology of happiness, students put what they know into action. Students use evidence-based practices that promote happiness. Students take action to promote their own happiness. The course culminates in a student-designed and conducted project that promotes happiness.

Bioethics - In this portion of the course, students take part in inquiry through in-depth extended literature reviews and analysis of biological concepts and their implications in numerous ethical scenarios. Students learn relevant biological principles as well as traditional philosophical schools of thought in order to discern bioethical principles. This portion of the course integrates concepts from anatomy/physiology, botany, ecology, biochemistry, and other disciplines in order to garner a greater understanding of the

intersection of biology and ethics. This portion of the course also culminates in a student-designed action project focused on a selected bioethical issue.

Dual Credit/ AP Biology

2 Semesters/2 Credits

Grade 11-12

Prerequisite – Biology I and Chemistry – Please consult with your current science teacher for best science course placement

This is a rigorous and fast paced course intended for students pursuing advanced credit in the life sciences. It is intended to prepare students for the College Board's Advanced Placement exam, as well as eight mandatory labs that will be completed during the course. Summer work may be assigned prior to the beginning of school in August. Students signing up for this class are required to take the AP exam in May and must meet Ivy Tech prerequisites in order to earn Dual Credit.

Dual Credit/AP Chemistry

2 Semesters/2 Credits

Grades 11-12

Prerequisite – Honors Chemistry and Algebra II.

Please consult with your current science teacher for best science course placement.

This is an advanced placement course designed to prepare the student for the AP Chemistry exam. This course covers the equivalent of one full year of college level general chemistry, comparable to a first year course at a college or university. This course is a rigorous math-based course, with a strong laboratory component. It is intended for students who have demonstrated a willingness to commit considerable time to studying and completing assignments outside of class, and who have successfully completed Honors Chemistry I or Chemistry I, and Algebra I. This course includes more in-depth analysis of material covered in Chemistry I, as well as new topics: kinetics, equilibrium, thermodynamics, electrochemistry, and nuclear chemistry. Students signing up for this class are required to take the AP exam in May and must meet Ivy Tech prerequisites in order to earn Dual Credit. The Knowledge Assessment from Ivy Tech for precalculus is a prerequisite for dual credit at Ivy Tech.

Dual Credit Introductory Chemistry

2 Semesters/2 credits

Grades 11-12

Prerequisite- completion of or concurrent enrollment in Alg II, Chemistry I

Please consult with your current science teacher for the best science course. Students who plan to major in science are encouraged to take AP Chemistry.

Intended for the motivated and self-directed student who plans to pursue a non-science degree at the college level. This second year of chemistry will be taught with the rigor of a college chem course.. Reinforces topics discussed in the first year of chemistry with a focus on techniques and reasoning of experimental chemistry. The class is intended to expose students to most topics and laboratory procedures they may face in chemistry at the post-secondary level.

Forensic Science

2 Semesters/2 Credits

Grades 11-12

Prerequisite – Chemistry or ICP

Please consult with your current science teacher for best science course placement.

Forensic Science is an application of science (chemistry, physics, and biology) to the criminal and civil laws that are enforced by police agencies in a criminal justice system. This course will focus on the application of science in the analysis of evidence collected at crime scenes as well as during autopsies. Topics covered in this course are: history of forensic science, crime scene drawing and investigation, evidence collection and analyzing, fingerprinting, blood and blood spatter analysis, forensic toxicology, and hair and fiber analysis in both a laboratory setting and in case studies. Sensitivity warning: Students will be exposed to and research true crime (both historic and current) which includes many sensitive and trigger warning topics

Environmental Science Advanced Placement

2 Semesters/2 Credits

Grades 11-12

Prerequisite – Biology and Chemistry – Please consult with your current science teacher for best science course placement.

AP Environmental Science is a rigorous and fast paced course covering aspects of national and global environmental systems, including ecosystems, population dynamics, resource management, and environmental consequences of natural and anthropogenic processes. The course is a good fit for all students interested in science and highly recommended for students considering a career related to Earth or Environmental Science. Laboratory and field experiences are required components of the course. Computer, Internet, math, and reading skills are necessary. Students signing up for this class are required to take the AP exam in May.

Science Research

2 Semesters/2 Credits

Grades 10-12

Prerequisite – Honors Biology or Biology I

Please consult with your current science teacher for best science course placement.

In the first semester of Science Research, students will practice and learn various lab techniques while designing their own research project and writing their own research paper. Types of lab techniques that will be used in the course include gel electrophoresis, the use of microscopes, aseptic technique, the use of statistical analysis, chromatography, and more. The research projects are picked and designed from the ground up by the students. By the end of the first semester, students should have written a background research paper and have a fully designed experiment.

In the second semester, students will follow the plan they designed for their research project and conduct their experiments. They will record their findings and create a presentation for the regional science fair in which they will compete. Depending on student performance, some students will be able to compete in higher level science fairs. After the science fairs, students will review their feedback from the judges and modify their experimental design.

2 Semesters/2 Credits

Dual Credit AP Physics II

Grade 11-12

Prerequisite – Physics I AP or Regular Physics ; concurrent with Pre-Calculus

Please consult with your current science teacher for best science course placement.

This course is the equivalent of a second-semester college course in algebra-based physics. The course covers fluid mechanics, Thermodynamics, electricity and magnetism, optics, and atomic and nuclear physics. Through inquiry-based learning, students will develop scientific critical thinking and reasoning skills. Students signing up for this class are required to take the AP exam in May. If students take the Algebra-Pre-Calc Exam, they may sign up and earn Dual Credit for Ivy Tech Physics 102.