

## **SCIENCE DEPARTMENT**

In order to achieve science literacy and to understand and be successful in today's complex technological world, three credits in science are required for graduation. All science courses are laboratory based, stress inquiry, problem solving and critical thinking. Students in college preparatory and academic classes are required to pass Foundation for Physics and Biology before they move on to the elective courses. Students who show exceptional ability will be recommended for enrollment in Honors Biology, Honors Chemistry and Honors Physics.

### **ENVIRONMENTAL SCIENCE HONORS**

This course is for students in grade 9. The course begins with scientific inquiry and an emphasis is on the RI State Science GSE's. Major concepts in environmental, earth, space, and physical science will be covered in this course. This is a laboratory-based program with many applications of technology. This course is very rigorous and fast paced.

Prerequisite – Teacher recommendation

Credit: 1

### **ENVIRONMENTAL SCIENCE CP STANDARD**

This course is for students in grade 9. The course begins with scientific inquiry and an emphasis is on the RI State Science GSE's. Major concepts in environmental, earth, space, and physical science will be covered in this course. This is a laboratory-based program with many applications of technology.

Credit: 1

### **ENVIRONMENTAL SCIENCE CP ESSENTIAL**

This course is for students in grade 9. The course begins with scientific inquiry and an emphasis is on the RI State Science GSE's. Major concepts in environmental, earth, space, and physical science will be covered in this course. This is a laboratory-based program with many applications of technology.

Credit: 1

### **BIOLOGY HONORS**

This rigorous first biology course is designed for honors level juniors. The emphasis is on the biochemistry, cell structure and function, energy transformations, genetics, evolution and ecology of living things. The course is laboratory and project-based, and includes many applications of technology. Research papers are a course component. Emphasis will be placed on the RI State Science GSE's.

Prerequisite: Environmental Science, Honors Chemistry & Teacher recommendation

Credit: 1

### **BIOLOGY CP STANDARD**

This first biology course is designed for juniors. The emphasis is on biochemistry, cell structure and function, energy transformations, genetics, evolution, and ecology of living things. Laboratory experiences, projects and hands-on activities are a vital part of the course. Computer and other technologies are integrated throughout the course. Emphasis will be placed on the RI State Science GSE's.

Prerequisite: Environmental Science, Chemistry & Teacher Recommendation

Credit: 1

### **BIOLOGY CP ESSENTIAL**

This first-year biology course is designed for non-college-bound sophomores. The major concepts of biology are covered, with an emphasis on applications to everyday experience and practical problems. Hands-on activities and demonstrations are used throughout to build skills and understanding of the nature and workings of living things. Computer and video technology are integrated throughout the course.

Prerequisite: Physical Science

Credit: 1

### **HUMAN ANATOMY AND PHYSIOLOGY HONORS**

This advanced biology elective is designed for students with an interest in health and medicine. A system's approach to the study of the human body is taken. A major portion of the course includes laboratory experiences, formal laboratory reports, research papers, and special projects. Dissection activities are used throughout the course.

Prerequisite: Teacher recommendation

Year Course OR Semester Course

Credit: 2 or 1

### **CHEMISTRY HONORS**

This course is designed as a first chemistry course for tenth-grade students who have taken Honors Environmental Science and have established themselves as highly motivated to handle challenging chemistry concepts. The major areas of energy, chemical equilibrium, chemical composition, periodic table properties, and chemical reactions are emphasized. Required laboratory experiments, formal laboratory reports, research papers, and special projects are all components of the course. Computer technology and other technologies are utilized throughout the course. An emphasis will be placed on the RI State Science GSE's.

Prerequisite: Environmental Science, Algebra I & Teacher Recommendation

Credit: 1

### **CHEMISTRY CP STANDARD**

This course is designed as a first chemistry course for tenth grade students who have taken Environmental Science. The major areas of energy, chemical equilibrium, chemical composition, periodic table properties, and chemical reactions are emphasized. Required laboratory experiments, formal laboratory reports, research papers, and special projects are all components of the course. Computer, technology and other technologies are utilized throughout the course. Emphasis will be placed on the RI State Science GSE's.

Prerequisite: Environmental Science, Algebra I & Teacher Recommendation

Credit: 1

### **CHEMISTRY CP ESSENTIAL**

This course is designed as a first chemistry course for tenth grade students who have taken Environmental Science. The major areas of energy, chemical equilibrium, chemical composition, periodic table properties, and chemical reactions are emphasized. Required laboratory experiments, formal laboratory reports, research papers, and special projects are all components of the course. Computer, technology and other technologies are utilized throughout the course. Emphasis will be placed on the RI State Science GSE's.

Prerequisite: Environmental Science, Algebra I & Teacher Recommendation

Credit: 1

### **CHEMISTRY II HONORS**

This is a continuation of the first-year chemistry course and is designed for the serious science student. The course reinforces fundamental principles such as atomic structure, thermodynamics, acid-base reactions, reaction equilibrium and electrochemistry in greater depth. Additional topics are organic and inorganic chemistry, analytical chemistry, biochemistry and nuclear chemistry. Required laboratory experiments, formal laboratory reports, research papers, and special projects are all components of the course. Computer, video and other technology are utilized throughout.

Prerequisite: Teacher recommendation

Credit: 1

### **PHYSICS HONORS**

This introductory physics course is designed for honors students with strong mathematics and science skills who have distinguished themselves in previous science courses. Topics include: motion, vectors, dynamics, mechanics, conservation of momentum, vibrations and waves, sound, light, mirrors and

lenses. Laboratory experiments with formal lab reports or journals, research projects, and individual and group special projects are all components of the course. Technology is also used throughout the course. Physics is required by most 4-year colleges and universities.

Open to Grades 11 and 12

Prerequisite: Honors Chemistry & Algebra 2 /Trig

Credit: 1

### **PHYSICS CP STANDARD**

This introductory physics course covers the basic physics topics including motion, conservation laws, Newton's Laws, simple machines, vibrations and waves, sound, light, and mirrors and lenses. The course is laboratory based and requires laboratory reports as well as special projects that include research. Technology is also used throughout the course. Physics is required by most 4-year colleges and universities.

Open to Grades 11 and 12

Prerequisite: Chemistry and Algebra I

Credit: 1

### **PHYSICS II HONORS**

This course is a continuation of the first year accelerated physics course. This course will reinforce basic principles such as motion, conservation and light. It will also introduce new topics such as rotational motion, fluid mechanics, thermo dynamics, and relativity and high-energy physics. Laboratory experiments require formal laboratory reports and/or journals; research requires formal papers and/or presentations using technology.

Prerequisite: Teacher recommendation and exceptionally strong math ability

Credit: 1

## **ELECTIVE COURSES**

### **ASTRONOMY**

This general elective surveys the history, mystery and splendor of the universe. Students will study the solar system as well as the physical universe. The emphasis will be on the evolution of the universe and the exploration of stars and our solar system. Laboratory experiments, hands-on activities, demonstrations and projects are used throughout the course to build skills an understanding of the universe. Computer, video and other technologies are utilized throughout the course.

Open to Grades 11 and 12

Prerequisite: Environmental Science and Biology

Credit: 1

## **BIOTECHNOLOGY**

This course offers students an overview of the Science of Biotechnology. Students learn how to extract DNA and create DNA Fingerprints, manipulate genes, grow and maintain cell cultures, perform tissue cloning experiments and learn how biotechnology is used in forensic science. Students use state of the art equipment to conduct experiments and explore the many applications of genetic engineering. This course also provides students with an overview of the Biotechnology Program and the many possible career paths.

1 Semester or Full Year with Teacher Recommendation

Credit: 1 or 2

## **FORENSIC SCIENCE**

This elective is open to all students interested in the application of science in law enforcement. Topics to be studied include, but are not limited to: crime scene investigation, fingerprinting, forensic toxicology, drug and organic analysis, DNA fingerprinting and serology.

Open to Grades 11-12

Prerequisite: Environmental Science & Biology & Teacher Recommendation

Credit: 1

## **ANIMAL ADAPTATION**

This course will expose students to a variety of animal behavioral, anatomical and physiological adaptations found among vertebrates and arthropods. This course is biology elective, and will focus on critical thinking and problem solving skills involving such topics as correlating adaptation, environment and ecology.

Prerequisite: Biology

Credit: .5

## **METEOROLOGY**

This general elective investigates the elements of meteorology; a study of major weather systems, and the effects of severe weather changes on man's economy, and short and long-term weather forecasting. Laboratory experiments, hands-on activities, demonstrations and projects are used to build skills. Computer, video and other technology are utilized throughout the course.

Open to Grades 11 and 12

Prerequisite: Environmental Science and Biology

Credit: .5

## **OCEANOGRAPHY**

This general elective covers the shape and evolution of the earth's oceans, ocean currents, the relationship to weather patterns and the physical and chemical properties of seawater. Continental shelf and coastline features will be studied in depth. Biotic relationships of the sea will be investigated, as well as

man's impact on the ocean. Laboratory experiments, hands-on activities, demonstrations and projects are used to build skills. Computer, video and other technologies are utilized throughout the course.

Open to Grades 11 and 12

Prerequisite: Environmental Science and Biology

Credit: .5