

SCIENCE DEPARTMENT

The large variety of course offerings in science allows the student considerable choice in structuring his/her own sequence to meet his/her needs and interests in the area of science. These courses are aligned to the New York State Science Learning Standards. In addition to science content, science and engineering practices will be emphasized as well.

Life Science:

- Regents Life Science: Biology
- AP Biology
- Human Nutrition (.5)
- Human Anatomy and Physiology A (Fall) (.5)*
- Human Anatomy and Physiology B (Spring) (.5)*
- Biomedical Sciences/Medical Interventions (Fall) (.5)
- NUSTEP: Public Health and Epidemiology (Spring) (.5)*
- Marine and Freshwater Biology (.5)

Physical Setting:

- Regents Earth and Space Sciences
- Regents Chemistry
- Regents Physics
- Astronomy/Astrobiology (Spring) (.5)
- Natural Disasters and Meteorology (Fall) (.5)
- NUSTEP Forensic Science (.5)*
- Applied Physical Science
- The Science of Food (Cooking, Processing and Engineering) (.5)
- Science Fact or Fiction: A Study of Modern Science in Media and Literature (.5)
- AP Environmental Science*
- AP Chemistry
- AP Physics C (Mechanics)
- AP Physics C (Electricity and Magnetism)

NOTE: To qualify to take a Regents examination in any of the sciences, a student must complete 1200 minutes of actual hands-on laboratory experience with satisfactory documented laboratory reports. The 1200 minutes of laboratory experience must be in addition to the required classroom instruction associated with earning a unit of credit. Additional laboratory requirements, unique to a particular course, are noted in the course descriptions.

* These courses can be taken as Dual Enrollment courses affiliated with local colleges and universities for college credit.

Please consult with your school counselor or science teacher for a more specific pathway/sequence of science courses based upon your interest in:

Environmental Studies and Sustainability Pathway

The Environmental Studies and Sustainability Pathway at Iroquois High School will offer a unique opportunity for students to expand their understanding of environmental concepts, ecosystem stewardship, natural resource sustainability, and their sense of place in today's world.

Example of a Current Pathway Progression

	9 th Grade	10 th Grade	11 th Grade	12 th Grade
Core Course Work	Regents Earth and Space Science or Regents Biology	Regents Biology	Regents Chemistry	Regents (or AP) Physics
Electives (Students select courses from the following – recommended that 4 credits of elective coursework be taken through the high school career)	Natural Disasters and Meteorology (1/2 year) Astronomy (1/2 year) Marine Biology and Freshwater Biology (1/2 year) AP Biology (full year) or AP Chemistry (full year) AP Environmental Science (full year) AP Physics (full year)			



Health Science Pathway

Example of a Current Pathway Progression

	9 th Grade	10 th Grade	11 th Grade	12 th Grade
Core Course Work	Regents Earth and Space Science or Regents Biology	Regents Biology	Regents Chemistry	Regents (or AP) Physics
Electives (Students select courses from the following – recommended that 4 credits of elective coursework be taken through the high school career)	Anatomy and Physiology A (1/2 year) Anatomy and Physiology B (1/2 year) Biomedical Science/Medical Interventions (1/2 year) NUSTEP Public Health and Epidemiology (1/2 year) NUSTEP Forensics (1/2 year) AP Biology (full year) or AP Chemistry (full year) AP Physics (full year)			



General Recommendation of Course Sequences:

The suggested sequence for a basic Regents Diploma would be as follows:

- Grade 9 Earth and Space Sciences
- Grade 10 Life Science: Biology
- Grade 11 Choice of Applied Physical Science, or
- (Select 2) Astronomy/Astrobiology, Environmental Science, Human Anatomy and Physiology A and B, NUSTEP Public Health and Epidemiology, Human Nutrition, Science Fact or Fiction.

The suggested sequence for an Advanced Regents Diploma is as follows:

- Earth and Space Sciences
- Life Science: Biology
- Chemistry
- Physics and AP Chemistry, AP Biology and/or AP Environmental
- AP Physics C – Mechanics
- AP Physics C - Electricity

REGENTS SCIENCE COURSES

EARTH AND SPACE SCIENCES (4310)

40 weeks - 1 credit

Open to Grades 9, 10, 11, 12

Regents Exam

Regents Earth and Space Sciences is designed for students to explain more in-depth phenomena while building upon the ideas and skills that were taught in Middle School. This course will not only teach core ideas within earth and space sciences, but it will also blend in concepts from the other science disciplines as well. Through the implementation of observation and measurement of the world around us, students will investigate their world through firsthand experiences. Students will gain a better understanding of the Earth, and the world around them, while also appreciating the process of change. Successful completion of a laboratory component, as noted in the introduction to the Science Course offerings, is required for admission to the Regents Examination.

* *Three NYS Designed Investigations, must be completed prior to the written portion of the Regents Examination.* *

The syllabus contains 5 required units:

1. Space Systems
2. History of Earth
3. Earth's Systems
4. Weather & Climate
5. Human Sustainability

LIFE SCIENCE: BIOLOGY (4304)

40 weeks - 1 credit

Open to Grades 9, 10, 11, 12

Regents Exam

Prerequisite: Earth and Space Sciences credit earned

The Life Science: Biology is a course of study that provides an in-depth understanding of living things, and an appreciation of the natural world. It teaches students about organisms, their increasing complexity, and the adaptations of the earth's inhabitants. Students learn proper laboratory techniques, including the use of the microscope, and other various laboratory skills. They are expected to apply concrete concepts to new or unique situations. Successful completion of a laboratory component, as noted in the introduction to the Science Course offerings, including 3 specified State required laboratory experiences, is necessary for admission to the Regents Examination. Areas of study include:

1. The Nature of Life
2. Biochemistry
3. Cells and Cell Functions
4. Reproduction and Development
5. Genetics
6. Evolution
7. Ecology/Human Impact on the Environment
8. Human Anatomy and Physiology

REGENTS CHEMISTRY (4307)

40 weeks - 1 credit

Open to Grades 10, 11, 12

Regents Exam

Prerequisites:

- **Two Laboratory Science Course credits, plus**
- **Algebra and Geometry credits, plus**
- **Passing Algebra and Geometry exams, plus**
 - **Completion of or concurrent enrollment in Trigonometry/Algebra 2 or Algebra 2. (Algebra 2 is strongly recommended)**

This course is designed to present a modern view of chemistry suitable for students following the Regents course of study. Regents Chemistry expects of the student both a greater quantity and quality of learning. The chemistry student examines in-depth concepts and principles of chemical systems. This modern approach to chemistry is geared to open the high school student's mind to man's basic understanding of chemical functions. An important offshoot of this course is that the students learn to think critically and discipline their minds so that they may look at the physical world in an analytical fashion. Concept learning and critical thinking are brought about through problem solving and open-ended laboratory experimentation. Successful completion of a laboratory component, as noted in the introduction to the Science Course offerings, is required for admission to the Regents Examination.

Major topics covered in this course are:

- | | |
|---|--|
| 1. Matter and Energy | 8. Thermodynamics |
| 2. The Gas Laws and Kinetic Theory | 9. Kinetics and Equilibrium |
| 3. Atomic Structure | 10. Acid and Bases |
| 4. Chemical Bonding | 11. Oxidation–Reduction and Electrochemistry |
| 5. Periodic Table | 12. Organic Chemistry |
| 6. Solutions and Colligative Properties | 13. Nuclear Chemistry |
| 7. Mathematics of Chemistry | |

REGENTS PHYSICS (4312)

40 weeks - 1 credit

Open to Grades 11, 12

Regents Exam

Prerequisites:

- **Two Laboratory Science Course credits, plus**
- **Algebra and Geometry credits, plus**
- **Passing Algebra and Geometry exams, plus**
- **Completion of Regents Chemistry prior to taking the course is strongly recommended**

This course presents a modern view of physics with major emphasis placed on the fundamental concepts underlying this physical science. The objectives of this course extend beyond a minimal comprehension of basic facts and principles of physics. The appreciation of the scientific methods, the ability and willingness to change belief and opinions after careful weighing of new evidence and the development of critical thinking are important outcomes of the study in this course. Successful completion of a laboratory component as noted in the introduction to the science course offerings is required for admission to the Regents examination.

This course is divided into six units:

1. Mechanics
2. Motion in a Plane
3. Energy
4. Wave Phenomena
5. Electricity & Magnetism
6. Modern Physics

ADVANCED PLACEMENT COURSES

ADVANCEMENT PLACEMENT BIOLOGY (4305)

40 weeks – 1 credit

Open to Grades 11, 12
AP Exam

Suggested Prerequisites:

- **Life Science: Biology and Chemistry credits earned**
- **Academic Advisement**

The AP Biology course places emphasis upon the principal topics covered in a two-semester college freshman biology course. The aim of this course is to develop an understanding of the following underlying principles:

- Big Idea 1: Evolution – the process of evolution drives the diversity and unity of life
- Big Idea 2: Cellular Processes (Energy and Communication) – Biological systems utilize free energy and molecular building blocks to grow
- Big Idea 3: Genetics and Information Transfer – living systems store, retrieve, transmit and respond to information essential to life processes
- Big Idea 4: Interactions – Biological systems interact and these systems and their interactions possess complex properties

All of the topics aim to provide students with the conceptual framework, factual knowledge and analytical skills necessary to deal critically with advancements in the field of biology. This course requires academic discipline and a significant time commitment outside of class to master topics. A strong interest in the biological sciences is helpful. **All students are required to take the Advanced Placement Exam in May.**

ADVANCED PLACEMENT CHEMISTRY (4308)

40 weeks – 1 credit

Open to Grades 11, 12

AP Exam

Suggested Prerequisites:

- **Three Laboratory Science Credits, including Regents Chemistry (Regents Physics strongly recommended, and may be taken concurrently)**
- **Algebra 2 (Pre-Calculus or College/AP Calculus strongly recommended, may be taken concurrently)**
- **Academic Advisement**

The Advanced Placement course in Chemistry meets the objectives of a general Chemistry course at the college level and is designed to build on the foundation learned in Regents Chemistry. Students in such a course will attain a depth of understanding of fundamental and a reasonable competence in dealing with chemical problems. The course is designed to contribute to the development of the student's ability to think clearly and to express his ideas, orally and in writing, with clarity and logic. This course differs from the Regents course with respect to the kind of textbook used, the topics covered, the emphasis on chemical calculations and the mathematical formulation of principles and the kind of laboratory work done. Quantitative differences appear in the number of topics tested, the time spent in the course, and the nature and the variety of experiments done in the laboratory. Many new laboratory skills will be learned including competence in the use of data collecting instrumentation. **All students are required to take the Advanced Placement Exam in May.**

ADVANCEMENT PLACEMENT ENVIRONMENTAL SCIENCE (4316)

40 weeks – 1 credit

Open to Grades 10, 11, 12

AP Exam

Suggested Prerequisites:

- **Earth and Space Sciences, Life Science: Biology**

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and man-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them. AP Environmental Science involves science as a process of understanding; energy conversions in ecological processes; earth as one interconnected system; humans altering and disrupting natural systems; environmental problems involving cultural, social, economic, ethical and historical connections. **All students are required to take the Advanced Placement Exam in May.**

ADVANCED PLACEMENT PHYSICS C MECHANICS (4333)

40 weeks - 1 credit

Open to Grade 11, 12

AP Exam

Suggested Prerequisites:

- Three Laboratory Science Credits earned
- Algebra 2 and Pre-Calculus credits earned
- Concurrently enrolled in AP Calculus or College Calculus 1
- Academic Advisement/Teacher Recommendation
- Exceptional Students can bypass taking the Regents Physics class and the concurrent enrollment in Calculus with teacher permission. These students will have acknowledged that they will have work during the summer prior to taking AP Physics C Mechanics and that they will have more independent work during the year to learn the Calculus skills necessary.

Advanced Placement Physics C Mechanics, is a college level, calculus-based physics course. It is equivalent to the course that college students majoring in science and engineering take during their freshmen year. Topics of study include:

- | | |
|--------------|-------------------|
| - kinematics | -planetary motion |
| - vectors | -rotation |
| - forces | -torque |
| - dynamics | -oscillations |
| - momentum | -gravitation |
| - energy | |

AP Physics C is a lab course which provides opportunities for students to develop skills in: operation of technical equipment; experimental design; data collection, analysis, and interpretation; critical thinking; and problem solving. **All students are required to take the AP Physics C Mechanics exam in May.** *All AP students in this course are also required to take a school final examination or Regents Physics Exam in June.*

ADVANCED PLACEMENT PHYSICS C ELECTRICITY & MAGNETISM (4334)

40 weeks - 1 credit

Open to Grade 12
AP Exam

Suggested Prerequisites:

- **Three Laboratory Science Credits earned**
- **Regents Physics Credit earned**
- **Algebra 2 and Pre-Calculus credits earned**
- **Concurrently enrolled in AP Calculus or College Calculus 1**
- **Prior completion or concurrently enrolled in AP Physics C Mechanics**
- **Academic Advisement/Teacher Recommendation**

Advanced Placement Physics C Electricity & Magnetism, is a college level, calculus-based physics course. It is equivalent to the course that college students majoring in science and engineering take during their freshmen year. Topics of study include:

-electricity -magnetism

AP Physics C is a lab course which provides opportunities for students to develop skills in: operation of technical equipment; experimental design; data collection, analysis, and interpretation; critical thinking; and problem solving. **All students are required to take the AP Physics C Electricity & Magnetism exam in May.**

NOTE: Students enrolled in either AP Chemistry, AP Physics C (Mechanics and/or Electricity & Magnetism, AP Environmental Science or AP Biology will take the advanced placement examination(s) for that particular course. This examination is administered in the month of May. All AP students are also required to take a school final examination in June.

CONCURRENT/DUAL ENROLLMENT COURSES

HUMAN ANATOMY AND PHYSIOLOGY A (4322)

20 weeks – 1/2 credit

*Open to Grades 11, 12
Grade 10 with Teacher Approval
Offered Fall semester only*

Prerequisite: Life Science: Biology credit earned

This course provides a comprehensive study of the anatomy and physiology of the human body. Students will learn how the various organs of the body interact with one another and how they contribute to the overall physiology of the body. (*Note the units of study and body systems in this course*). Students will design experiments to investigate the structures and functions of the human body. Pathology will also be studied as examples of disruption to normal body homeostasis. This course is designed to be similar to a college level course for students in studying the structures and functions of the human body in scientific detail.

Units by topic: Unit 1 – Orientation, Anatomical Language, and Histology
Unit 2 – Support and Movement
Unit 3 – Integration and Coordination

By the end of this course students will be able to:

1. Describe how the human body is studied including the use of specific terminology.
2. Understand the functions of each organ system – how structure related to function.
3. Develop the skills of scientific inquiry while learning concepts in the classroom, lab and field.
4. Students will understand how biological and social concepts related to the content are applied to the health science career pathway.

**** It is highly recommended that students enrolled in Human Anatomy and Physiology A also enroll for the Spring Semester of Human Anatomy and Physiology B.**

HUMAN ANATOMY AND PHYSIOLOGY B (4325)

20 weeks – 1/2 credit

Open to Grades 11, 12
Grade 10 with Teacher Approval
Offered Spring semester only

(College Credit available through Hilbert College. Must complete A & B in the same school year)

Prerequisite: Life Science: Biology credit earned

This course provides a comprehensive study of the anatomy and physiology of the human body. Students will learn how the various organs of the body interact with one another and how they contribute to the overall physiology of the body. *(Note the units of study and body systems in this course. These are different than Human Anatomy and Physiology A).* Students will design experiments to investigate the structures and functions of the human body. Pathology will also be studied as examples of disruption to normal body homeostasis. This course is designed to be similar to a college level course for students in studying the structures and functions of the human body in scientific detail.

Units by topic: Unit 4 – Transport

Unit 5 – Absorption and Excretion

Unit 6 – Human Life Cycle

By the end of this course students will be able to:

1. Describe how the human body is studied including the use of specific terminology.
2. Understand the functions of each organ system and how structure related to function.
3. Develop the skills of scientific inquiry while learning concepts in the classroom, lab and field.
4. Students will understand how biological and social concepts related to the content are applied to the health science career pathway.

Please note: Human Anatomy and Physiology A and B are independent of each other. A student may take B before A and be on track with understanding the information. HAPA does NOT need to be a pre-requisite to HAPB if the student is not taking the course for College Credit.

Students successfully completing Human Anatomy and Physiology A and B will be eligible for Dual Enrollment to earn 4 college credits through Hilbert College.

NUSTEP FORENSICS (4324)*Open to Grades 11, 12*20 weeks – 1/2 credit *(College Credit available thru Niagara University)*

Prerequisites: Life Science: Biology credit earned

Concurrent Enrollment in Chemistry or Chemistry Credit earned

This interdisciplinary course will investigate the field of forensics from scientific and legal points of view. It is a college-level course which provides students with the opportunity to receive college credit for work done in high school. The course is designed to provide students with an educational experience equivalent to a first-year college level science class. In this course, students will:

- Learn to collect, test, interpret, and analyze data scientifically.
- Conduct lab experiences to examine and test; prints from fingers, lips, teeth, shoes, tires, and eyes; forensic toxicology of drugs, alcohol, poisons; and trace evidence, such as hair, fibers, and paint.
- Forensic serology collection and investigation techniques will be applied to testing of samples of simulated body fluids, such as blood, sweat, saliva, and tears.

This course is offered through Niagara University but is taught at our high school by a certified high school instructor. As a half-year course, students who successfully complete the course can earn one-half of a high school credit. Students who pay the Niagara University tuition and successfully complete the class can earn three college credits.

NUSTEP PUBLIC HEALTH AND EPIDEMIOLOGY (4330)

20 weeks – 1/2 credit

Open to Grades 10, 11, 12

Offered Spring semester only

(College Credit available thru Niagara University)

Prerequisite: Life Science: Biology credit earned

Public Health is about what makes us sick, what keeps us healthy, and what we can do about it as communities, populations and societies. This course provides an introduction to public health concepts and practice. Topics include historical perspectives on the contributions and roles of public health, an introduction to epidemiological methods, health from a global perspective, an introduction to tools for disease control and health promotion, and issues of health care delivery.

Topics to be covered include:

- What is public health?
- Introduction to Epidemiology - the Basic Science of Public Health
- Biostatistics: Calculating the Public's Health
- Environmental Impacts on Health
- Social, Cultural, and Behavioral (Mental) Factors in Health
- The US Medical Care System

Throughout the course students will:

- Explore and describe complex challenges associated with “public health”
- Analyze multi-dimensional problems associated with public health care delivery
- Effectively communicate complex multi-dimensional challenges associated with public health care delivery while also making recommendations for improved efficiency, based on the synthesis and extrapolation of various sources of scientific information

This course is offered through Niagara University but is taught at our high school by a certified high school instructor. As a half-year course, students who successfully complete the course can earn one-half of a high school credit. Students who pay the Niagara University tuition and successfully complete the class can earn three college credits. It is recommended that students taking the course for College Credit be in Grades 11 and 12.

SCIENCE ELECTIVES

APPLIED PHYSICAL SCIENCE (4311)

40 weeks – 1 credit

Open to Grades 11, 12

Local Exam

Prerequisite: Two Laboratory Course credits, plus Algebra

This course is intended for non-science majors who are interested in a course in physical science. It is for the average student whose interests and goals may be different from those who take the Regents Physics and Regents Chemistry courses. It is an activities-based course which relates scientific principles to issues which are of current national interest and debate. This Applied Physical Science course includes a laboratory component and is designed so that most of the understanding should develop from activities relating to all of the other sciences. Principles of Physics and Chemistry encompass all of the events that occur in the real world.

Major topics covered in this course are:

- 1. Measurement*
- 2. Classification and Separation of Mixtures*
- 3. Atomic Structure and the Periodic Table*
- 4. Chemistry in the Home*
- 5. Energy and Alternative Technologies*
- 6. Electricity and Magnetism*
7. Waves: Sound, Light and Optics
8. Forces and Projectiles

ASTRONOMY/ASTROBIOLOGY (4314)

20 weeks - 1/2 credit

*Open to Grades 9, 10, 11, 12**Offered Spring semester only***Prerequisite: Earth and Space Sciences credit**

The first quarter of this course is designed to give a non-mathematical survey of the structure of the universe with a major look at our nearest celestial objects. Students will study our own Solar System with emphasis on the Sun, planets, moons, comets and asteroids. Throughout the course, the major observable constellations in the nighttime sky will be studied in detail. A brief look at America's space program, past and future will be discussed.

The second quarter of this course will introduce students to the relatively new field of astrobiology. Astrobiology is the study of the origin, evolution, distribution, and future of life in the universe. This multidisciplinary field encompasses the search for habitable environments in our Solar System and habitable planets outside our Solar System, the search for evidence of prebiotic chemistry, and the evidence for life on Mars. In addition, laboratory and field research into the origins and early evolution of life on Earth, and studies of the potential for life to adapt to challenges on Earth and in space will be studied.

Laboratory sessions and hands-on activities are designed to supplement lectures. Students will be responsible for two major research projects and will have the privilege of attending a field trip to a working space lab with planetarium to help visualize what they are learning in the classroom.

BIOMEDICAL SCIENCES/MEDICAL INTERVENTIONS (4323)

20 weeks – 1/2 credit

*Open to Grades 10, 11, 12**Offered Fall semester only***Prerequisite: Life Science: Biology credit earned**

This course is designed to provide students with the foundation of knowledge that they would need if they are interested in pursuing a career in the health sciences. In this course, students investigate various health conditions, both genetic and infectious in nature. They will study the areas of prevention, diagnosis, and treatment of diseases. In doing so, students will be exposed to a range of topics related to cancer, immunology, surgery, genetics, pharmacology, medical devices, and diagnostics. Students will develop solutions for medical conditions, employing the same skill set required in the field of biomedical engineering. Students will also investigate the impact of disease-causing microorganisms on the public health infrastructure and study the medical and pharmaceutical advances on the evolution of these microorganisms. Finally, students will explore the varied career opportunities available within the health and biomedical sciences, conduct research on possible career paths, and identify the skills needed for each one.

HUMAN NUTRITION (4318)*Open to Grades 10, 11, 12*20 weeks – 1/2 credit (*currently not approved NCAA course*)

Prerequisite: Life Science: Biology and/or Chemistry credit earned

This course is an introduction to human nutrition. It provides students with a basic understanding of the relationships between nutrition, health and disease prevention. Topics covered include history of diet, digestive system and disorders, understanding food labels, macronutrients, micronutrients, sustainability and farming, influences on food choice, advertising, diet and health, and food safety. An individual research project is required.

Note: This is not a cooking class. Proper food handling and storage is discussed but making food in the classroom is limited.

MARINE AND FRESHWATER BIOLOGY(4335)*Open to Grades 10, 11, 12*

20 weeks - 1/2 credit

**Prerequisite: Earth and Space Sciences and Life Science: Biology credits earned
Concurrent enrollment or credits earned in Regents Chemistry**

This course is designed for students interested in marine biology and studying species found in the oceans and our local Great Lakes ecosystem. Course material will focus on the major groups of organisms found in marine and freshwater habitats, the physical and chemical properties that are important for structuring marine and freshwater communities, and the ecological processes that affect these communities and ecosystems. This will be a laboratory based course in which students are involved in both field studies and classroom investigations, such as the design and maintenance of a sustainable freshwater or marine habitat in class. Students will also be involved in citizen science partnerships with local organizations, including Sea Grant and Buffalo Riverkeeper.

NATURAL DISASTERS and METEOROLOGY (4329)

20 weeks – 1/2 credit

Open to Grades 9, 10, 11, 12

Offered Fall semester only

Prerequisite: Earth and Space Sciences credit earned

Students in this course will review basic atmospheric science principles that influence both daily weather changes and global climate. An emphasis will be placed on extreme weather events and natural disasters. Students will be able to practice and investigate the use of instruments to record weather data including modern satellites (GOES 16) and NEXRAD Radar systems. They will also gain insight into long range modeling using a carbon cycle simulator to determine the factors that may influence long term global climate change. Students will gain experience in media-based weather forecasts by preparing a daily forecast to be included in the daily announcements broadcast at the high school. Perhaps most important, students will learn widely applicable skills including effectively communicating weather forecasts to the public, working collaboratively with classmates to solve modern engineering challenges related to severe weather, and to become empathetic and globally aware citizens; traits that Iroquois High School feels are necessary in all of its graduates.

SCIENCE FACT OR FICTION: A STUDY OF MODERN SCIENCE IN MEDIA AND LITERATURE (4327)

Open to Grades 10, 11, 12

20 weeks- 1/2 credit

**Prerequisites: Earth and Space Sciences credit earned
Completion of/or concurrent enrollment in Life Science: Biology**

This interdisciplinary course will provide students with the opportunity to learn about new advancements in science and technology and how these advancements are portrayed to the American public in the media (film) and literature (fiction and non-fiction). An emphasis of this course will be to look at how scientific information is presented to the public and how to evaluate the credibility of this information. In this course, issues in modern science and the media (i.e., artificial intelligence, bringing back extinct species, “growing” meat in the lab, human colonization of other planets, forensic evidence) are examined and discussed.

This course will place an emphasis on learning the science content through lecture and laboratory activities and then analyzing the accuracy of this science as it is brought to the public through television journalists, modern film, and literature. The course will be designed so that students will increase their literacy skills through hands-on science activities, scientific reading selections, writing tasks, and verbal communication through individual and group presentations. This course is designed as a general science course, open to all sophomores, juniors and seniors who have successfully completed at least one Regents Science Course.

Topics of study may include:

- Global Climate Change – Media: *Day After Tomorrow*
- Human Colonization of Another Planet – Media/Literature: *The Martian*
- Genetic Engineering – Media: *GATTACA*
- Cloning – Media/Literature: *Jurassic Park*
- Epidemiology- Media: *Contagion*
- Computer Science and AI – Media: *Blade Runner*

THE SCIENCE OF FOOD (COOKING, PROCESSING, AND ENGINEERING) (4331)

20 weeks- 1/2 credit *(currently not approved NCAA course)*

Open to Grades 10, 11, 12

Prerequisite: Earth and Space Sciences, Life Science: Biology and Chemistry credit earned, or concurrent enrollment

This course will provide students with an introduction to the chemical and physical properties of food. Students will investigate how cooking techniques influence the taste and texture of food items based on their chemical composition. Students will explore the major processing and preservation principles involved in large-scale food production. Students will understand the relationship between science and technology in the production of various food products. The course will also include a discussion of current issues related to food, health and the environment (i.e. the impact of food allergies on the production of food, safety of GMOs, impact of food choices on the environment).

Topics to be studied may include:

- Food Safety/Large Scale Food Production Techniques
- What does it mean to be Organic?/GM?
- Use of Sugars in Baking
- Caramelization and Candy Chemistry
- Gluten vs. Gluten-Free Foods
- Meat Preparation - Browning, Braising and Brining
- Emulsification/Aeration – (production of dips and dressings, ice cream, meringue)
- Dehydrated Foods/Space Food
- Biological agents used in Food
- Fermentation – Production of Carbonated Beverages, Sauerkraut, Leavened Bread
- Enzymes/Fungi – Cheese Production
- Probiotics/Bacteria – Yogurt

* Note – This class will involve a hands-on cooking component, some of which will need to be done at home