

**Academy of Our Lady of Mercy  
Lauralton Hall**

**SCIENCE DEPARTMENT  
Course Descriptions 2008-2009**

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|---|-------------|-----------------|
| <b>(5111) Newtonian Physics (Honors)</b>  | <b>Year</b> | <b>1 Credit</b> |
| <i>(Prerequisite: Algebra Honors; or Geometry Honors taken concurrently.)</i>   |             |                 |
| This is an in-depth physics course, which is designed to develop a working vocabulary and a sound foundation in the major divisions of physics. This course includes the interpretation and the application of mathematical concepts needed to understand the laws of physics. Central to the course is the establishment of proper experimental procedure and proficient interpretation and reporting of observed phenomena. Concepts are reinforced through hands-on activities, virtual and actual demonstrations and one lab per cycle. |             |                 |
| <b>(5112) Physics in Action (CP1)</b>   | <b>Year</b> | <b>1 Credit</b> |
| An inquiry based, introductory physics course designed to introduce the student to fundamental physics concepts and how they apply to "real-world" situations. Topics include atomic structure, force and motion, and electricity and magnetism. Concepts will be reinforced through hands-on activities, virtual and actual demonstrations and one lab per cycle.  |             |                 |
| <b>(5113) Physics in Action (CP2)</b>   | <b>Year</b> | <b>1 Credit</b> |
| This course explores the same basic concepts as Physics CP1. This course is designed to provide more individualized instruction through simulations and web-based learning with an emphasis on vocabulary and concepts. There is one lab per cycle.   |             |                 |
| <b>(5221) Inorganic Chemistry (Honors)</b>  | <b>Year</b> | <b>1 Credit</b> |
| <i>(Prerequisite: Minimum year average of 78 in Physics Honors or minimum year average of 94 in Physics CP1.)</i>   |             |                 |
| This course covers the fundamental principles and classical laws of chemistry. Students will master concepts through mathematical interpretation, analysis and experiential lab activities. Scientific reading and writing skills are reinforced throughout the course. Lab work is included in every cycle.  |             |                 |
| <b>(5222) Modern Chemistry (CP1)</b>  | <b>Year</b> | <b>1 Credit</b> |
| <i>(Prerequisites: Physics; Geometry CP1 may be taken concurrently.)</i>  |             |                 |
| This course is a study of the structure and interaction of matter. Emphasis is placed on problem solving, vocabulary, formula writing, chemical equations, nomenclature and the atomic theory. The course includes one lab per cycle, which allows for the observation and study of chemical processes.   |             |                 |
| <b>(5223) Conceptual Chemistry (CP2)</b>  | <b>Year</b> | <b>1 Credit</b> |
| <i>(Prerequisite: Physics; Geometry CP2 may be taken concurrently.)</i>   |             |                 |
| This course covers the same basic topics in chemistry as Science 5412, with more emphasis on descriptive chemistry, and less emphasis on mathematical concepts. One lab is included every cycle.  |             |                 |
| <b>(5311) Cellular and Molecular Biology (Honors)</b>   | <b>Year</b> | <b>1 Credit</b> |
| <i>(Prerequisite: Minimum year average of 78 in Chemistry Honors or minimum year average of 94 in Chemistry CP1.)</i>   |             |                 |
| This introductory course in biology emphasizes the molecular and cellular processes of organisms. In addition, it includes an exploration of biological kingdoms, ecology, genetics and evolution. Participation in discussion and proficiency in analytical scientific writing are expected. Concepts presented in lecture are reinforced in one lab per cycle.  |             |                 |

**(5332) Cellular & Molecular Biology (CP1)**

**Year**

**1 Credit**

*(Prerequisites: Physics and Chemistry)*

A comprehensive exploration of cellular biology includes such topics as cell transport, cell respiration, photosynthesis, protein synthesis, genetics and evolution. The lab serves to reinforce topics covered during the week.

**(5333) Cellular & Molecular Biology (CP2)**

**Year**

**1 Credit**

*(Prerequisites: Physics and Chemistry)*

This course covers the same basic concepts as Science 5212. The course is designed to provide more individualized instruction with an emphasis on biological vocabulary and concepts. Course content is reinforced through lab activities and demonstrations.

**(551) Biology (Advanced Placement)**

**Year**

**1 Credit**

*(Prerequisite: Minimum year average of 85 in Biology Honors.)*

As part of the advanced placement program, AP Biology is designed to be the equivalent of a college introductory course. Three general areas of study include: Molecules and Cells, Heredity and Evolution, and Organisms and Populations. Students will typically be responsible for two chapters per week of science reading, and thus make a commitment to extended homework time. The course will include extended lab time to cover the lab work included on the advanced placement exam. Students will take the AP Biology exam in May.

**(5401) Physics (Advanced Placement)**

**Year**

**1 Credit**

*(Prerequisites: Minimum year average of 85 in Physics Honors and Algebra 2/Trig Honors.)*

As part of the advanced placement program, AP Physics is designed to be the equivalent of a college introductory course. The general areas of study include: mechanics, heat, kinetic theory and thermodynamics, and electricity and magnetism, as well as wave theory and modern particle physics. Students will further the mastery of concepts learned in Physics I, with an integration of concepts from Chemistry and Biology. Concepts presented in lecture are reinforced in one lab per cycle to cover lab work included on the advanced placement exam. Students will take the AP Physics exam in May.

**(5421) Anatomy and Physiology (Honors)**

**Year**

**1 Credit**

*(Prerequisite: Open to seniors with minimum year average of 78 in Biology Honors, or minimum year average of 94 in Chemistry CP1.)*

This advanced biology course is designed for students planning to major in science or enter a premedical program. The course consists of a detailed study of the structure and function of the human systems and stresses biochemical mechanisms. Lab work is reinforced with lab practical exams. Dissection, as well as, virtual dissection and data-collection technology is required by all students. In addition, students will complete an independent study of current research in a selected area of human physiology and will give a presentation to assess proficiency.

**(5422) Anatomy and Physiology (CP1)**

**Year**

**1 Credit**

*(Prerequisite: Open to seniors with minimum year average of 78 in Chemistry CP1, or minimum year average of 85 in Chemistry CP2.)*

This course is designed for students with an interest in continuing their study of biology, or who plan to major in an allied health field. The course concentrates on the function of the human systems with an emphasis on homeostasis and regulation. Lab work reinforces concepts presented in class and is designed to relate body structure and function. Virtual dissection and data-collection technology will be explored and actual dissection is required by all students.

**(5412) Oceanography (CP1)**

**Year**

**1 Credit**

*(Prerequisite: Open to seniors who have completed Chemistry CP1 or received a minimum grade of 70 in Chemistry CP2. May be taken concurrently with any junior Honors science course.)*

An advanced interdisciplinary course is designed for students concerned about the environmental issues impacting the marine environment. Students will be required to investigate issues such as global warming, over-fishing, invasive species, and marine disasters by integrating topics from across the sub-disciplines of oceanography. Students will collect, measure, analyze, and evaluate data as well as complete an independent study of current research regarding a selected issue of personal interest. Students will present their research to assess proficiency. Dissection is required by all students.

**(5431) Introduction to Forensic Science (Honors)**

**Year**

**1 Credit**

*(Prerequisites: Open to seniors with minimum year average of 78 in Biology Honors.)*

This advanced Forensic Science course is the application of science to the examination of physical evidence obtained in the investigation of a crime scene. This course will cover many topics such as crime scene analysis, collection of physical evidence, firearm analysis, DNA analysis, blood typing and spatter analysis, fingerprints, hair and fiber analysis, toxicology and pathology. Both the lecture and laboratory emphasize the role of forensic science within the criminal justice system. Lab work is reinforced with lab practical exams. When possible, guest lectures by forensic professionals will supplement the class.

**(5432) Introduction to Forensic Science (CP1)**

**Year**

**1 Credit**

*(Prerequisite: Open to seniors with minimum year average of 78 in Biology CP1.)*

This course is the application of science to the examination of physical evidence obtained in the investigation of a crime scene. This course will cover many topics such as crime scene analysis, collection of physical evidence, firearm analysis, DNA analysis, blood typing and spatter analysis, fingerprints, hair and fiber analysis, toxicology and pathology. Both the lecture and laboratory emphasize the role of forensic science within the criminal justice system. When possible, guest lectures by forensic professionals will supplement the class.

**(5441) Environmental Science (Advanced Placement)**

**Year**

**1 Credit**

*(Prerequisites: Open to seniors with a minimum year average of 78 in Biology Honors, or minimum year average of 85 in Chemistry CP1. Open to juniors concurrently taking Biology Honors.)*

As part of the advanced placement program, AP Environmental Science is designed to be the equivalent of a one-semester college introductory natural resources course taught over the entire high school year. The course is designed to provide students with the content and skills needed to understand the various interrelationships in the natural world, to identify and analyze environmental problems and to propose and examine solutions to these problems. Course content encompasses human population dynamics, interrelationships in nature, energy flow, resources, environmental quality, human impact on environmental systems and environmental law. The course will include extended lab time to cover the data analysis questions on the advanced placement exam (120 min./cycle for lab; 40 min. lecture/day). Students are required to take the AP Environmental Science exam in May.