

SCIENCE

***Applied Biology: Human Evolutionary Biology** **BIO301** **3 credits**

SEM 1. Open to grades 11 and 12. Prerequisite: Permission of the department.

Human evolutionary biology is the study of human evolution and behavior from a biological perspective. Human behavior is complex and influenced by many factors. Our goal in this course is to try to make sense of some of those behaviors by studying the lives of both our ancient ancestors and our closest living relatives. By studying topics such as evolutionary human origins and anatomy, social groupings and interactions, and the evolution and purpose of sexual behavior, we can begin to explain why we modern humans make some of the choices we make. The course includes both discussion of readings and laboratory work, and culminates with an original research project. Familiarity with the vocabulary of DNA and genetics is helpful.

Applied Biology: Experimental Biology **BIO302** **3 credits**

SEM 2. Open to grades 11 and 12. Prerequisite: Permission of the department.

In Experimental Biology, teams of students follow a single research thread for an entire semester. Tentative research categories are exercise physiology, animal behavior, winter food production, and microbiology. Students move through multiple cycles of planning, data gathering, analysis, and refinements of their hypotheses. While individual research is possible, it is in the context of working with a subject-area team. Prior knowledge of biology is less important than a willingness to immerse oneself in persistent, creative research.

***Advanced Biology** **BIO401** **6 credits**

YEAR. Open to grades 10, 11, and 12. Prerequisite: Permission of the department; completion of Chemistry is strongly recommended.

Advanced Biology is a college-level course that focuses on the various modes of thought that biologists employ. Major experiments and research projects model various fields of biology, ranging from the molecular focus of genetics to the interconnections of ecology. Rather than race to cram information, students pursue fewer topics in considerable depth, focusing on the interconnections and complexity of living systems. Students are expected to take substantial initiative and responsibility for their learning in and out of class. They also are required to take on a yearlong independent research project. Labs emphasize the development of collaborative skills and the application of ideas explored in the course. While it is not necessary to have taken a previous biology course, some basic knowledge is assumed.

Earth Science: Geology **ENV201** **3 credits**

SEM 1. Open to grades 10, 11, and 12. Prerequisite: Two semesters of high school science.

Earth is a dramatically active system of processes, from awe-inspiring events such as earthquakes, volcanoes, floods, and hurricanes to subtle processes such as frost wedging, creep, and soil development. The course begins with the study of how matter is recycled through Earth's processes, how energy flows through and drives these processes, and how life webs depend on and influence the constant change of matter and energy. Studying geologic time illustrates how slow but steady processes can be just as important as catastrophic Earth-altering events. The course builds toward researching Earth system processes affecting a region of one's choosing and providing an experience of using science for making choices and decisions.

Earth Science: Oceanography **ENV202** **3 credits**

SEM 2. Open to grades 10, 11, and 12. Prerequisite: Two semesters of high school science, and Earth Science: Geology.

Oceanography is an interdisciplinary science that draws on a variety of other scientific disciplines to explain the ocean realm. Using experiments, computer simulations, and data analysis, the factors that make water move are studied to provide an understanding of how the oceans influence many of Earth's systems. Water's unique physical properties are explored, focusing on why our Blue Planet is so special. The final unit focuses on the biology and ecology of the marine world.

***Applied Environmental Science:**

Water Conflicts at Home and Abroad

ENV301 **3 credits**

SEM 1. Open to grades 11 and 12. Prerequisite: Permission of the department.

Approximately one in eight people worldwide lacks access to safe drinking water. Less than one percent (0.825%) of all the water on Earth is potentially available for drinking water. Thus, issues regarding the protection and distribution of this precious resource have caused and will cause many conflicts. This seminar course examines this most precious resource and presents students with an opportunity to consider important water management issues through case studies of conflicts at local, national, and international levels. Core themes in regions ranging from the greater Boston metropolis to the Colorado River basin to