SC311 Marine and Atmospheric Chemistry (3-0-3)  
Professor D. O’Sullivan  
An introduction to chemical processes that influence the chemistry of marine waters and the atmospheric marine boundary layer. The course will begin with the composition of seawater and progress towards an understanding of the biogeochemical cycles of important elements in oceanic systems, including the chemistry of tropospheric ozone and aerosol formation. The impact these process have on current and future naval operations will be discussed. Prereq: SC112 or validation equivalents.

SB453 Neuroscience and Developmental Biology (3-2-4)  
Assistant Professor D. Isaac  
This course offers an advanced treatment of neuroscience and developmental biology that builds on both the molecular and cellular background provided in SB251 and the basic principles underlying nervous system function introduced in SB252 and applies them to topics including both somatic and special sensory modalities, initiation, execution and coordination of motor programs and the neuroanatomical organization of the pathways that control these functions. Additional special topics will be introduced on a rotating basis. The course will also use the examples set by studies performed in model organisms to elucidate the mechanisms by which normal development proceeds in higher eukaryotes with an emphasis on neural development. Prereq: SB252. The course does not count as a chemistry major elective.

SC485B Chemical Ecology of Organisms (3-0-3)  
Associate Professor B. Rehill  
Many organisms protect themselves either directly or indirectly using chemical defenses, and communicate consciously or unconsciously via chemical senses. Understanding these chemically mediated interactions has helped humans increase agricultural productivity, protect themselves from disease, and better manage natural resources. This course will explore the chemistry, biochemistry and applications of chemically mediated interactions, including mechanisms of defense and communication, the vast array of natural products, and synthetic pathways. Organisms discussed will include microbes, plants, and animals including humans. Prereqs: SC112 and either SB201/SB211/or SB251, or with instructor permission

SC485C Does the Chemistry Make Sense and How to Explain It to a Non-chemist. (3-0-3)  
Professor C. Whitaker  
This course will focus on the many different techniques for the presentation and collection of scientific data. Students will have the opportunity to create labs to investigate chemical phenomenon on display in the world around us. The course participants will hone their presentation skills by developing lectures and posters. They will learn how to deliver chemical information to large and small audiences. The goal is to give the students a better understanding of the chemistry they are inundated with on a daily basis and how to disseminate this information once it has gone through an internal filter. Topics to be discussed will range from art history to “Breaking Bad” the TV series. Prereqs: SC225, SC226, SC261 and SC262.
SC286 Art Conservation Chemistry (3-0-3)
Associate Professor J. Lomax
Objects exist in time. Investigating the physical content of art and artifacts can give us insight into the mind a culture of the people who created the object. The history of an object (what happened to it since it was created) can leave it obscured, weakened or damaged. It is the job of conservators to mitigate or sometime reverse the effects of the fourth dimension on these three-dimensional objects. Chemistry’s analytical techniques are exquisitely capable of determining content of objects and the effect of time on them. Though scientists have been assisting in museums since the 19th century, the explosion of modern micro-analytical techniques and computer assisted analysis have made it possible to probe art and artifacts non-destructively or using samples that are smaller than can be seen with the naked eye. This course will deal with the chemical aspects of art conservation as well as the philosophy and ethics of science involved in art conservation. Though we will be covering analytical techniques not discussed in General Chemistry, the classroom and laboratory presentation will not assume any knowledge beyond SC111/112. Pre-reqs:  SC111, SC112 or validation equivalents.

SC336 Biochemistry II (3-0-3)
Assistant Professor C. Sweet
This course will provide advanced treatment of topics covered in SC335, such as biomolecular structure, bioenergetics and enzyme kinetics, and cover the following new material as well: biosynthesis of amino acids, nucleotides and cofactors; photosynthesis and plant metabolic cycles; signal transduction; molecular genetics; regulation of eukaryotic and prokaryotic gene expression. There will be an introduction to virology, immunology and the metabolism of specialized cells. Prereq: SC335.

SC416 Analytical Chemistry in Forensic Investigations (3-0-3)
Professor C. Copper
This course will allow you to use your knowledge of chemistry to appreciate how modern forensic investigators solve criminal cases, both high-profile and routine. The ingenuity of the criminal mind can be thwarted by the application of chemical and instrumental methods such as DNA fingerprinting, drug detection, arson investigations, bombings, and characterization of fibers and paint. In the Integrated Laboratory sequence, we have used many of the chemical and instrumental techniques used to solve crimes, and their application to forensics will help you to understand their basic principles and applicability. Some “hands-on” experience in laboratory techniques is also planned for this course. In addition, the use of case studies will help you understand the role of science in the larger world. Prereq: SC363.
Organic Chemistry is the study of the reactions of carbon compounds. Biochemistry is the study of the chemical reactions in living systems. This course will explore the connection between these two sub-disciplines of chemistry by looking at the organic reactions involved in many biological pathways. Among other topics, we’ll examine the biosynthesis of steroids and the metabolism of amino acids; looking at the intermediate compounds and mechanisms of their formation from the organic point of view, writing mechanisms and showing how the reactions are examples of what you learned in organic chemistry. This course will fulfill the elective requirement of the biochemistry option. 

Prereqs: SC226 and SC335.