

**2007-2008 Teaching Log**  
**Eugenia Paulus**  
**North Hennepin Community College**

**Fall 2007**

**CHEM 2061 *Organic Chemistry I*** (level: sophomore)

This chemistry course is a prerequisite for many professional programs like Medicine, Pharmacy, Dentistry, Veterinary Science and Biomedical Engineering. This course introduces the students to covalent Carbon compounds and their chemistry. Though the students have studied chemistry prior to this course, there are several novel concepts that they are required to understand, such as stereochemistry, mechanistic approaches to reactions and the use of spectroscopic techniques to study the structure of molecules. Even the best students tend to feel challenged in this course and initially believe that their potential for success is limited. They need to be reminded and reassured that, though it appears impossible to study this material, this was the same thought of earlier generations of students who have successfully completed this "rigorous course" and proceeded to higher academic studies. Students are helped to visualize the three-dimensional structure of organic molecules and reaction mechanisms using model kits and computer simulations. Students also benefit from paper and pen practice work in class and from individual mentoring. Discussing the applications of organic chemistry, for example, relating the stereochemical structure of an organic molecule to the stereospecific action of a drug, makes this chemistry come alive. It is indeed a new world to many students, bewildering and strange: molecules that can be isolated from natural products, a unique and different system of nomenclature and the ability to design the synthesis of a molecule with real life applications.

Some students enrolled in the laboratory segment of this course are under-prepared for the laboratory experience, since they lack the necessary practical skills. An exceptional tutorial created by Professor Paulus enables them to view the necessary techniques several times before they commence their experimentation.

**CHEM 405 *Biochemistry I*** (level: junior/senior)

This course is an introduction to the chemistry of life, linking the structure and function of biological molecules in a healthy, functioning biological organism. The students study the chemistry of biomolecules at the molecular level and examine the impact of molecular changes at the macroscopic level. The student is encouraged to apply the information to actual real-life cases of disease. The laboratory provides the opportunity to experiment with biological samples and practice the art of scientific paper reading and writing. This is the class where intellectual curiosity is allowed to grow unhindered. The more you discover, the more you are able to connect the dots and view the bigger picture. Students are expected to make the connections between the different systems in the biological organism. Professor Paulus' role is more of a facilitator who channels the students' thoughts towards the discovery of knowledge. In this class, the importance of Chemistry in a biological system and the interdisciplinary relationship between the Sciences is emphasized. (This course is an offering of Minnesota State University Moorhead in collaboration with NHCC.)

**Spring 2008**

**CHEM 1061: *Principles of Chemistry I*** (level: freshman)

This course is designed for students entering a science career, as it lays the groundwork for further academic studies in chemistry and biology. Topics include the naming of chemical compounds and the writing of chemical formulae, stoichiometry, atomic structure, theories of chemical bonding, energy transformations during chemical reactions and the behavior of gases. The applications of these topics are then examined in the laboratory. Along with constructing a solid theoretical foundation, the student is assisted to foster critical thinking and analytical

reasoning skills; to develop a capacity to think through problems; and to become aware of the importance of chemistry in the world and its relevance in daily life. This course is fully embellished with real-life examples of chemistry, which are demonstrated or discussed. Unique pedagogical techniques are adopted to facilitate the retention of students with difficulties in the comprehension of chemistry. Online Web-based Learning, CD-ROMS and handouts with study tips are some of the additional aids to promote student success.

**CHEM 2062: *Organic Chemistry II*** (level: sophomore)

This course builds on the foundations of the Organic Chemistry I course and helps the student develop a comprehensive understanding of covalent carbon molecules and their derivatives. The student is made aware of all the different types of molecules including aromatics, bicyclics and heterocyclics and their reactions. Retrosynthetic problems and spectroscopic analysis are emphasized. Students in this course are preparing to transfer to professional programs, and activities such as journal reading, preparation for entrance exams, undergraduate research and poster presentations are undertaken. At the end of the course, the American Chemical Society (ACS) national standardized test is administered, and the correlation between their grades and the standardized tests are examined for assessment of the chemistry program at North Hennepin Community College.

During the course, the students visit the St. Cloud State University Chemistry Department for laboratory experience and attend presentations by eminent professors. Inquiry based learning is an essential part of the course. Therefore, some labs require independent resolution of a problem by the student. Students have the opportunity to venture into project work and devise a procedure or plan to solve a practical problem, using skills they have learned throughout their chemistry coursework.

Professor Paulus spends considerable time in guiding and counseling students for a smooth transition to the higher academic level and to ensure student success.