

Learning Goals for *Chemistry of the Environment*

The study of the environment entails the natural sciences integrated with the social sciences. It is critical that those concerned with the social, political, economic, and ethical issues involving the environment be aware of the scientific issues to better assess risks and benefits. This requires understanding technology-based issues that affect air and water quality, as well as other environmental issues, such as ozone depletion and alternative fuels. It also necessitates recognizing green chemistry, the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances, as beneficial to economical and ethical issues integrated with the sciences.ⁱ These skills are required to assist conscientious citizens to reach responsible environmental decisions in the future.

In response to a request from Project Kaleidoscope, Phi Beta Kappa stated that, “all graduates should be able to draw conclusions by reasoning from observations, experience, and experiment as part of the life of a liberally educated person.”ⁱⁱ One of the goals of college science laboratories is for students to develop critical thinking skills by planning and executing experiments, collecting and analyzing data, and comparing techniques. The *Chemistry of the Environment* laboratory at Hendrix section aims to engage the students with environmentally relevant laboratories concerning topics such as global warming, ozone depletion, acid rain, water quality, and alternative fuels. The laboratory exercises will focus on teaching the experimental methods for determining the nature and extent of a given environmental problem. Every topic will also use a green ethic to further stress the importance of green chemistry. In this way, students can develop the important life skills of critical thinking and questioning, as well as gain an understanding of how chemistry is related to environmental studies.

The laboratory coursework will also illustrate topics discussed in other Hendrix courses that focus on the environment. Most important is the impact that humans and technology have had on the ecosystem. This includes long-recognized problems such as the change in the carbon and sulfur cycles, as well as more recently recognized issues, such as the introduction of synthetic novel chemicals from medicines into our water systems, and the removal of potentially important nutrients from drinking water caused by the recent trend of bottled water.

In summary, this course aims to assist in the transformation of students into informed citizens that have experience studying all facets of the environment, including the social, economic, ethical, political, and scientific issues.

ⁱ Anastas et al. 2000

ⁱⁱ Churchill, J. *Discussion on Science Education*, The Phi Beta Kappa Society, May 2005.