Skill Workshop # 3: Ethics in Engineering Research

Speaker: Dr. Dan Oerther, Associate Professor, Civil and Environmental Engineering
College of Engineering, University of Cincinnati
Date: June 29, 2009
Time: 9:30 to 12:30a.m. (3 hours)

Prepared by
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This workshop was given by Dr. Daniel B. Oerther, Professor in the Department of Civil and Environmental Engineering, College of Engineering, University of Cincinnati on July 29, 2009 from 9:30 a.m. to 12:30 p.m. (3 hours). Dr. Oerther joined the University of Cincinnati in September 2000. He earned his B.A. in molecular biology and biochemistry, B.S. in environmental engineering from Northwestern University in 1995, and M.S. and Ph.D. in environmental engineering from the University of Illinois, Urbana in 1998 and 2002, respectively. Dr. Oerther's research interests include molecular microbial ecology, public health microbiology, and bioprocess engineering as well as sustainable development. As the director of the Molecular Biology Laboratory (MBL), his daily duties include meeting with team members, coordinating extramural funding, editing MBL publications, and instruction. Dr. Oerther is also serving as the director of the Center for Sustainable Urban Engineering. The photographs below show the workshop in progress.

Dr. Oerther Teaching (left) & Participants Playing Ethics Board Game (right)

This workshop focused on the “Ethics in Engineering.” Dr. Oerther did a very good job at displaying the difference in values, morals, and ethics and how they are related to the field of research. It was very interesting to see how everyone defined each of these definitions in comparison with the Webster definition. From this part of the talk the following definitions for each stood out: Values - A monetary value, Morals - The principles of right or wrong, Ethics - A theory of system of moral values, and Research - investigation or experimentation aimed at discovery, interpretation, and improvement. So from the book definition, Ethics in engineering is the monetary value of the principles of right and wrong. The definition was then refined to the proper code of conduct in research, which is very different from the ethics used in general in real life. There is a standard in research that must be maintained.

So, why is “Ethics” in research so important? In the talk Dr. Oerther focused on three points that are of great importance: (1) It is required if we want to believe in the work performed by others; (2) It is the fundamental basis of the peer review process; and (3) It helps us to identify the expected from the unexpected from erroneous results. Dr. Oerther made the point, “A month in the lab will save you a day in the library.” Other people do look at and evaluate the data

produced by others to help them with the new discovery's being made, it is important to credit the authors of the papers that have helped one along the way so that their paper can be considered valid.

The participants then played an Ethics Challenge Board Game which simulated various ethics case studies. The board game involved group discussions of real life situations and the course of actions, whether it required an ethical, moral, or political response. The game relied on previous knowledge and personal experiences on what the participants felt about an ethical decision, even if the ethical action seemed wrong to some people. Some of the case studies were: family members investing in a small portion of their company, employee misrepresenting themselves in a resume, sexual harassment, and a situation where a quality manager is suffering retribution for doing their job.

After the game, Dr. Oerther summarized the ABET (Accreditation Board for Engineering and Technology) set of standards which showed how, "Engineering is really all about serving the people." Thus ethics is an integral component on all professional work that engineers do. Overall the talk was very informative and interactive and much was learned about the depths of the topics in addition to the true meaning of "Ethics in Engineering."