Special Skills Workshop # 1: Ethics in Engineering Research

Speaker: Dr. Richard A. Miller, Professor, College of Engineering and Applied Science, University of Cincinnati
Date: Wednesday, June 23, 2010
Time: 9:30 AM -12:30 PM
Venue: University of Cincinnati, Baldwin Hall, room 641

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This workshop was given by Dr. Richard A. Miller, Professor of the Department of Civil and Environmental Engineering, College of Engineering and Applied Science, University of Cincinnati on June 23 from 9:30 AM -12:30 PM (3 hours). In attendance were 10 in-service teachers, 4 pre-service teachers (2 additional teachers were part of another RET program), and 12 engineering undergraduate students participating in a Summer REU Program. Dr. Miller obtained his Ph.D. in Civil Engineering from the Northwestern University in 1989. Dr. Miller's main research has focused on prestressed concrete structures, bridges, relationship between material damage and structural performance; fracture mechanics of concrete, nondestructive testing of concrete, early age mechanical properties of concrete and concrete structures; performance of civil engineering materials. Photographs taken during the workshop are presented below:

Dr. Miller Speaking

Dr. Miller told that engineers follow a code of ethics when conducting research, below is a list of the fundamental canons that engineers follow:

Engineers, in the fulfillment of their professional duties, shall:

- Hold paramount the safety, health, and welfare of the public.
- Perform services only in areas of their competence.
- Issue public statements only in an objective and truthful manner.
- Act for each employer or client as faithful agents or trustees.
- Avoid deceptive acts.

- Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession http://www.nspe.org/Ethics/CodeofEthics/index.html

Dr. Miller's seminar focused on the ethics of engineering and the impacts it can have on society. During his presentation he decided not to focus so much on "common sense" ethics as he put it, but more on the other more complex aspects of ethics faced by engineers. The major points of his presentation focused on being transparent, sustainability, and long term ethical responsibility. He often would refer back to the beliefs stated above, but then pose questions to the audience to what does this all really mean and why is it important.

During his presentation he pointed out why is "Ethics" in research so important? The need for research, in engineering to be transparent is of great importance because: (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. He even went so far as giving an extreme example about how he assumed data for one of his research projects, but within the report it explicitly cited where the data was assumed and had the original data also within the report. He then posed the question of "is this ethical." Dr. Miller stressed the need for work to be transparent at all times so people can make up their own minds about the work. 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.

Dr. Miller's lecture also looked at the bigger picture questions that engineers have to face when dealing with ethical issues. For him the issue of sustainability is paramount. First he posed the question "What does sustainability mean to you?" As the group came to the conclusion of long range well being for the human race, it lead to Dr. Miller's next question "Are engineers ethically responsible for what happens after they produce a product?" After some small discussion by the group, this question was followed up by Dr. Miller showing the group a song video by Tom Lehrer called *Wernher Von Braun*. Lehrer's song pokes fun at the rocket scientist Wernher Von Braun not thinking about the consequences of their work. The song is comical but does help support Dr. Miller's point of the need for foresight in the engineering community. Although it is impossible for any one person to predict the future and know the total impact of anything, the question still stands "Is it the ethical responsibility of an engineer to think about what might be the results of their actions." In which Dr. Miller referred back to the idea of sustainability and the need to keep this goal at the forefront of decision made.

At the end Dr. Miller 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.