ETHICS, HONESTLY

The hallway was empty when Professor Roel Snieder approached. "No Class Today" the sign on the door announced. But it wasn't true. Snieder had not cancelled class. "Steam was coming out of my ears," said Snieder, co-director of Mines' Ethics Across Campus (EAC) program.

A few moments later two late-arriving students appeared. "Since no one is here," one asked, "would you give us some advice on a project we're doing?" Not wanting to waste the hour, the still seething Snieder agreed and followed them into a classroom. "April Fool!" yelled the laughing students from the not-really-cancelled class. Snieder laughed a little too, but the nervous students quickly got serious. It was clear that honesty isn't something Snieder is comfortable joking about – even on April 1.

EAC encompasses many ethics-related educational, research and outreach activities. Consistent with Mines' mission statement and its goals for undergraduate and graduate students, ABET (the engineering accreditation agency) criteria, and National Institutes of Health and National Science Foundation requirements, EAC promotes responsible and ethical conduct.

Mines has always stood for integrity, of course, but in an increasingly complex world, ethics reflection and research have expanded and become more formalized.

As Snieder, who holds the Keck Foundation Endowed Chair of Basic Exploration Science, has noted: "Science and engineering in the broadest sense not only help us better understand the world in which we live; these fields also increase the power that we hold over the world. Unfortunately, neither science nor engineering comes with a recipe for how to use that power."

Undergraduate courses under the EAC umbrella include Nature and Human Values, Environmental Ethics, and Engineering and Social Justice, all delivered by the Division of Liberal Arts and International Studies (LAIS). Students in the LAIS basic general ethics course get practical experience each spring selecting a winner for the Golden Rotary Club "Ethics in Business Award." And LAIS faculty working with Metallurgical and Materials Engineering Professor Corinne Packard recently secured a new NSF grant to infuse modules on the ethics of nanotechnology into the undergraduate LAIS curriculum.

Graduate courses include The Art of Science and Introduction to Research Ethics, which is team-taught by a faculty member from LAIS and another from applied science and engineering. And since 2010, LAIS Assistant Professor Jason Delborne has taken a small group of Mines graduate students to "Science Outside the Lab," a policy immersion program in Washington D.C.

LAIS Professor Carl Mitcham,

10 ETHICS QUESTIONS FOR THE SCIENTIST OR ENGINEER
By Roel Snieder, Mines professor

What do I value?
What do I want to grow?
Who, or what, do I serve with my work?
What is the noble purpose of my work?
What types of errors are ethically acceptable?
Why is trust so essential in science?
Why does plagiarism constitute an ethical problem?
Why file for a patent?
Who should be among the authors of a paper?
Who should be first author?

EAC co-director and director of the Hennebach Program in the Humanities, regularly serves as one instructor in the team-taught Research Ethics seminar. As Mitcham explains, pedagogical research has shown that the effectiveness of such a class depends on an interdisciplinary approach and interaction among participants. Working together, faculty and students collaborate to:

- Compare, contrast and evaluate basic ethical theories
- Address a range of real-world ethical issues they may confront in their professional lives
- Articulate their own ethical ideals and commitments to science, society and the environment

Mitcham and Snieder are repeatedly impressed by the depth of thought and conviction that students reveal in the personal ethics statements that cap their seminars. They don't grade the specific ethical perspective students develop, but rather look for the quality of argumentation and materials the students use to support their positions. The process is inspiring. "Their seriousness encourages me to try to lead a more serious life as well," said Mitcham.

Mitcham is, indeed, serious about the field of ethics. He has edited a four-volume *Encyclopedia of Science, Technology, and Ethics* (2005), which will come out in a second edition next year. As an expert for the European Commission's Directorate-General for Research and Innovation, Mitcham is also the editor of a report, "Ethical and Regulatory Challenges to Science and Research Policy at the Global Level." This report's proposal for the promotion of global standards for responsible research and innovation has been endorsed by the Danish presidency of the European Union, which recently sponsored an international conference on "Science in Dialogue: Toward a European Model for Responsible Research and Innovation." Mitcham was an invited participant.

As Mitcham and co-author Adam Briggle argue in Ethics and Science, forthcoming from Cambridge University Press, "The kind of world we are creating will not simply be decided by expanding scientific knowledge, but will depend on views about good and bad, right and wrong."