

Addressing Societal Concerns through Education in Engineering and Science

By Arjun Makhijani, PhD

President, Institute for Energy and Environmental Research (IEER)

Democracy cannot work if science and technology remain in a black box. People need some basic knowledge of engineering and science in order to make informed judgments about a wide variety of global issues, such as energy policy, nuclear proliferation, climate change, toxic materials, and genetically modified components in food. The gap in technical knowledge between what the public knows and what it needs to know to make informed decisions that will ensure survival—to say nothing of justice, democracy and well-being—is growing.

IEER is partnering with students, faculty, and their communities in a project to develop curricula for community colleges, colleges, and universities. These curricula will be widely used to educate students about the engineering and scientific aspects of international security and the environment. As an example, a curriculum that was developed for use at East Tennessee State University will be discussed.

Participating faculty develop curricula for entire courses as well as modules that fit into existing courses, such as in physics, chemistry, biology, engineering design, environmental studies, security, peace studies, health, geography, and history. These curricula are geared for freshmen and sophomore college students, and for advanced placement junior and senior students in high school. Research projects are also designed, which may be suitable for junior and senior college students and graduate students.

The curricula will engage students in questions of compelling societal importance – from engineering and scientific viewpoints – through case studies ranging across many issues, such as managing pollution caused by nuclear weapons and power production, and increasing efficiency of draft animal energy in rural areas of South Asia to improve production and reduce environmental impact. Such case studies will give students a practical basis from which to newly appreciate their studies.

Through this unique curriculum project, IEER aims to enable students to use engineering and scientific knowledge to address some of the biggest problems of our current age: nuclear proliferation and waste, pollution, health problems, and sustainability. The success of the project depends on building partnerships that include faculty, students, and members of the wider community.

Contact:

IEER

6935 Laurel Avenue, Suite 201

Takoma Park, MD 20912

301 270-5500

ieer@ieer.org