

Nano Education at Michigan Tech: Science, Engineering and Societal Implications

Bruce E. Seely, John Jaszczak, Michelle Miller, and Gerard Caneba

Thanks to an NSF award from the Nanotechnology Undergraduate Education (NUE) competition, Michigan Tech is attempting to introduce a significant number of first- and second- year engineering and science students to the fundamental issues related to science and engineering at the nanoscale. In recognition of the full curriculum faced by most technical and science students in their first two years, Michigan Tech's nano education efforts have had to find creative ways to introduce students to nanotechnology. A working group involving about 20 faculty from across the campus are supporting this project, which exposes students to the basic science and the engineering applications, but which also pays special attention to the societal implications of this unfolding field of science and engineering. This paper reports on the experiences in introducing the various elements that are part of the project. These include:

- 1) developing modules, units, problems, and exercises within a number of existing introductory courses in engineering fundamentals, physics, mechanical engineering, and social sciences;
- 2) creating a one-credit seminar for the second semester on the Fundamentals of Nanoscale Science and Engineering, team-taught by a physicist, an engineer and a social scientist;
- 3) supporting a program of research experiences for undergraduates (REUs) with faculty engaged in nanoscale studies;
- 4) sponsoring a public lecture series;
- 5) creating and maintaining a website with animations and other material to support of the various undergraduate activities, and to enhance the dissemination of the courses and activities in nano education.