

C&I 693C: SPTP Ethics in Scientific Research
CNR 18265 is for secondary science teachers
CNR: 18277 is for science and engineering students

The Department of Curriculum and Instruction / Literacy Studies is offering a new, fully on-line course on the ethical, legal and socio-scientific issues related to advances in bio- nanotechnologies.

Course Goal: This course fosters the development of knowledge, understandings and skills graduate students must possess to effectively consider the issues of the Responsible Conduct of Research and research-related socio-scientific issues (SSI) specifically as related to the practice, application and teaching of bio – nanotechnology research.

Learning Objectives and Outcomes: By the end of instruction students will be able to

- (a) *provide* evidence that they accept and value the complexity of ethical concerns that mediate everyday practices in scientific research.
- (b) *exhibit* an in depth understanding of various societal issues brought about by advances in novel science such as biotechnology and nanotechnology.
- (c) *analyze* a variety of socio-scientific issues in scientific research and science teaching.
- (d) *apply* their understanding of SSI to the solution of common problems in science and engineering practice as well as the teaching of science and engineering concepts.
- (e) *create* an original project (curriculum unit or research focused poster) based on course readings, discussions and collaborative work.

Pre-Requisite: Graduate student standing – visit <http://graduateeducation.wvu.edu/> to apply. Contact the instruction for permit of registration before signing up for the course. Special permits are possible.

Instructional Approach: This is a fully on-line course combines a-synchronous (on your time) work with synchronous, on-line (eCampus/WIMBA) based discussions of key ethical practices of scientific research. The instructional methodology combines weekly, independent readings of brief news articles and summaries of ethical issues, followed by student responses by discussion-board posting, reflection, and response to others' posting. Each four weeks of a-synchronous work will be followed by a synchronous discussion. The synchronous discussions will be scheduled for a day/ time suitable for all participants. Students will apply the readings from each unit to design and develop a final project (60% of the grade) that will be an instructional unit (science teachers) or a poster presentation with brief literature on a selected research topic (science and engineering students).

Upon individual agreement secondary science teachers will have an opportunity to receive an extra credit (and a stipend) for teaching their unit in their classrooms and for providing data on students' learning based on their unit. You can implement your unit in May/June.

Necessary Technology: Headphones with microphone, a computer with internet access and a web browser with setup to view images and movies (U-tube, teacher-tube, shockwave or other). Adobe acrobat reader and Microsoft office (specifically Microsoft word and PowerPoint) will also be used.

About the Instructor: Dr. Eva Erdosne Toth is Assistant Professor of Science Education HR&E / WVNano Initiative (Eva.Toth@mail.wvu.edu or call (304)-293-7239). She is a former high school science teacher who holds a Ph.D. in Curriculum and Instruction with focus on the uses of educational technologies. She has conducted post-doctoral work at the University of Pittsburgh, LRDC and the Department of Psychology at Carnegie Mellon University was Vice-Director for Education in Genomics Science at Allegheny General Hospital. Her teaching of modern science concepts (biotechnology) as well as her research on learning has received significant federal and local funding. She has published over 25 research articles and book chapters on science learning and teaching. Currently, her teaching and research efforts are funded by the WVNano Initiative - <http://wvnano.wvu.edu/index.html>.