Instructor: Dr. Daneesh Simien  
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Grade:  
30% Current Event  Scale: 90-100 A  
50% Project  80-89 B  
20% Participation  65-79 C  
100% TOTAL  50-64 D

Classes: Fridays at 3:00 – 3:50 PM in ESB 207

Objectives: To introduce students to the original Nanoscale Science and Engineering (NSE) literature, that is, articles in research-level science or engineering journals, and to develop their skills in building interdisciplinary teams to design solutions to meet identifiable societal needs.

Outcomes: After completing this course, students will be able (a) to critically discuss recent NSE innovations based on news articles and original scientific and engineering literature, (b) to participate in the discovery and innovation cycle through interdisciplinary team-building activities, (c) to articulate the societal needs that these innovations are designed to fill, and (d) to discuss societal or ethical concerns that may be associated with design acceptance.

Current Event: Each student will be assigned a day in which to make a ten-minute PowerPoint presentation on a current event in nanoscience or technology, a new discovery or idea drawn from such sources as

http://www.euronanotechnews.com/  
Nano Engineering News  
Nano Electronics News  
Nano Medicine News  
http://www.nsti.org/news/  
Nano World News  
http://nanotechweb.org/  
Nano Tech Web  
http://www.nanowerk.com/

Students are encouraged to subscribe to these news services. For full credit on a current event presentation, the student must include material drawn from one or more original journal articles. Students can obtain PDF
copies of journal articles to which WVU subscribes through INSPEC or other databases available at the WVU libraries web page, http://www.libraries.wvu.edu/databases/

The PowerPoint presentation should answer the questions “What has been done?” and “Why is it interesting?” and should include a bibliography that includes all sources of information, including at least one news source and at least one article from the original science or engineering literature. After each report, the presenter may respond to questions on the subject from members of the class. Presenters should try to understand as much as they can about the subject, but do not need to understand all of the background science or technology.

Within one week of the presentation, students should send the instructor (a) a copy of the PowerPoint presentation and (b) a copy of at least one original article that appears in its bibliography.

Project: Each student will serve as the principal investigator for a project and will assemble an interdisciplinary team, consisting of student members in the class, based on the needs of the project. For full credit, each project team must include at least one member from another discipline. The principal investigator will lead three in-class presentations for each project, a brainstorming discussion, a project proposal, and a final report. Each presentation should include five components: (a) a societal need on which the project is based, (b) an NSE approach for fulfilling this need, (c) background science and engineering needed for the design solution, (d) mathematical analysis, modeling, and/or design, and (e) societal and ethical concerns that might affect design acceptance.

Brainstorming discussion: Each student will be assigned a day early in the semester in which to lead a project brainstorming discussion. On this day, the student will identify a societal need and an NSE idea or ideas for fulfilling this need. The student will then solicit feedback and glean from the disciplinary expertise of classmates and the instructor(s) in order to flesh out the idea and to discuss alternatives. Based on this discussion and on subsequent research and discussions held outside of class, the student will identify team members and invite them to participate. This section of the class will last about 5 weeks in the beginning of the semester.

Project proposal: Each student will prepare a one-page project proposal with the help of his/her team. The proposal will include the five components listed above as well as a statement of the role of each team member. The student will present this proposal in a five-minute PowerPoint presentation on an assigned day before mid semester. This section of the class will last about 5 weeks in the middle of the semester.
**Final report:** Near the end of the semester, the principal investigator will submit a five-page final project report and will give a PowerPoint presentation on the completed project that includes the five components listed above. A bibliography acknowledging all sources of information used in the study is required for both the talk and the paper. Verbatim quotations of more than four consecutive words from any source, including the Internet, must be placed within quotation marks, and their source must be acknowledged. Sources must also be acknowledged for images, short video segments, or other materials. These sources must include at least one article from the original science or engineering literature. This section of the class will last about 5 weeks towards the end of the semester.

**Participation:** Students will receive credit for active involvement in class discussions and as members of at least one project team. If a student is not invited to join any teams, he or she may volunteer to serve on a team, suggesting to the principal investigator how he or she might contribute. A student may also decline to participate on a team. Participation (asking questions, sharing relevant personal experience and insights, etc.) during classroom discussions is strongly encouraged. The goal is for each student to participate during each class period. Attendance is expected for all class sessions. One unexcused absence will be allowed per student without loss of credit. Additional unexcused absences will be reflected on the grade proportionally. Missing half the classes will result in failing the course.

**Schedule:**

The Schedule is to be determined based on the class enrollment

**Social Justice:** West Virginia University is committed to social justice. I concur with that commitment and expect to maintain a positive learning environment based upon open communication, mutual respect, and non-discrimination. Our University does not discriminate on the basis of race, sex, age, disability, veteran’s status, religion, sexual orientation, color or national origin. Any suggestions as to how to further such a positive and open environment in this class will be appreciated and given serious consideration. If you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class, please advise me and make appropriate arrangements with the Office of Disability Services (293-6700).