ENGR 381
Junior Nanotechnology Seminar II
West Virginia University

Instructor: Dr. Dimitris Korakakis
745, Engineering Sciences Building, Dept CSEE
293-0405 ext. 2512
Dimitris.korakakis@mail.wvu.edu

Grade:

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<td>Proposal Write-up</td>
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Classes: Monday 4:00 – 4:50 PM ESB 211

Objectives: The objectives of the junior seminar course series are to familiarize the students with science and engineering that is being carried out in laboratories at WVU, to match students with these laboratories in preparation for their senior research capstone, to help the students appreciate the importance of the fundamentals they are learning in their discipline in the development of NSE, and to help the students understand the importance of other disciplinary approaches to Nanoscale Science and Engineering (NSE).

Outcomes: The learning outcomes of this course are to enable students to (a) Describe the interdisciplinary approaches that are needed to solve the problems addressed by their research project; (b) Outline a research project and describe how their disciplinary expertise can help to complete it; (c) Approach research questions from an interdisciplinary perspective; (d) Communicate the preliminary results of their research to colleagues in multiple disciplines and e) Recognize the ethical and social implications of effective engineering design.

Organization: During the first part of the seminar the proposal preparation will be discussed. Based on National Science Foundation (NSF) Request for Proposals the students will familiarize themselves with proposal structure and requirements. The students will also be asked to evaluate, and be critical of, a proposal that has been submitted to the NSF.

During the second part of the seminar the students will develop a proposal for the research work that will be performed during their senior year. The proposal will include the following:

1. PROJECT SUMMARY

In no more than one-page, provide an overview of the proposed work. The Project Summary must explicitly address, in separately labeled statements, both NSF-approved merit review
criteria: Intellectual Merit and Broader Impacts. Proposals failing to explicitly address
Intellectual Merit and Broader Impacts in the Project Summary will be returned without
review.

2. PROJECT DESCRIPTION
The project description for your proposal should contain the following components:

a. Goals and Objectives. The goals of the project should be stated clearly and concisely
in relation to the learning outcomes as outlined in the list above.

b. Results of Prior Support. Use this section to describe coursework (in your major as
well as the Nanosystems Emphasis) and prior research experiences that are relevant
to this project. How will the content and/or skills that you developed inform your
project?

c. Detailed Project Plan. The project plan should be the longest section of the Project
Description. It should include description of the project's features, clearly
delineating the nanoscale components as well as the specific disciplinary approach,
as well as its potential societal impact and relevance. The plan should include:

a. Background on the proposed project describing how it builds on previous
nanoscale research;

b. Statement describing the expected impact of the project on the research in your
mentor's laboratory;

c. Description of the potential societal benefits of the project as well as any ethical
issues or other concerns and how these would be alleviated;

d. Experience and Capability of the Principal Investigator (you). Briefly describe
the experience and capability of the PI. Include a brief description of why,
focusing on your disciplinary training, you are the appropriate person to
complete this work

e. Roles of other contributors. State the expertise that others will contribute to the
work, focusing on how you will draw from the expertise of other disciplines, as
appropriate. If you will not need outside expertise to complete this specific
project, discuss the potential contribution of other disciplines to your mentor’s
overall project of which your work is a part.

All proposals are evaluated through use of the two National Science Board (NSB)-approved
merit review criteria: intellectual merit and the broader impacts of the proposed effort. In
some instances, however, we may employ additional criteria as required to highlight the
specific objectives of certain programs and activities. The two NSB-approved merit review
criteria are listed below. The criteria include considerations that help define them. These
considerations are suggestions and not all will apply to any given proposal. While proposers
must address both merit review criteria, reviewers will be asked to address only those
considerations that are relevant to the proposal being considered.

What is the intellectual merit of the proposed activity?
How important is the proposed activity to advancing knowledge and understanding within
its own field or across different fields? How well qualified is the proposer (individual or team) to conduct the project? (If appropriate, the reviewer will comment on the quality of the prior work.) To what extent does the proposed activity suggest and explore creative and original concepts? How well conceived and organized is the proposed activity?

**What are the broader impacts of the proposed activity?**

What may be the benefits of the proposed activity to society? Have any potential ethical issues or other concerns been identified? How will the effects of these be addressed?

In addition to the above, the following elements will be used to evaluate proposals:

- Does the proposal focus on nanoscale research with attention to inter/multi-disciplinary approaches?

- Are the goals and measurable expected outcomes defined and are they appropriate to the scope, scale, and state of the project?

- Does the proposal describe a convincing rationale and appropriate methods?

- Is there a clear work plan that is aligned with the expected outcomes?

- Is the project likely to produce high quality results?

- Are expected results defined and appropriate?

- What is the extent to which creative, interdisciplinary approaches are utilized?

Social Justice: We are committed to fostering a nurturing learning environment based upon open communication, mutual respect, and non-discrimination on the basis of race, sex, age, disability, veteran status, religion, sexual orientation, color, or national origin. Please advise us if you are a person with a disability and anticipate needing any type of accommodation in order to participate in this class. Please see us also to discuss special circumstances requiring possible exceptions to policy. Strict academic integrity is expected and is strictly enforced.