Research Project Rubric - Paper

585.751.81 Immunoengineering

You will produce **2 final products** for this course’s final project surrounding the same topic. You will come up with an engineering solution to a current disease or challenge in immunology. This should be an investigation of novel scientific ideas or new model systems, tools, or technologies that have the potential for significant impact on biomedical research or therapy. This will be in the form of a short, written proposal (similar to an R21) and a short pitch presentation. Below you will find specifications for each deliverable and what you will be evaluated on. Your ultimate goal is to convince your company/investors/government that your idea is worth funding.

## Written Proposal (150 points)

**Formatting**

* Maximum 6 pages with figures (not including title page or bibliography)
  1. Tip: you may use *Mendeley* for automatically generating your bibliography
* No smaller than 0.5’’ margins
* Include a title page including the title of project, name, class
* Include Titles for major sections
  1. Tip: Titles (differently formatted) and section headers can break up the report providing an easy to read document with adequate whitespace
  2. Tip: Example major sections could include: Significance, Innovation, Approach as we focused on earlier with subsections below.
* Must number, provide captions, and reference figures and tables in the text
  1. Tip: Make sure that figures that you use from other people or your own are easy to read (no small fonts)
* No smaller than 11 pt. font
  1. Tip: Use easy to read fonts such as Times New Roman, Calibri, Arial, etc.

## Evaluation

Your overall evaluation will be based on an assessment of the likelihood for the project to exert a sustained, powerful influence on the research fields involved; and must be an immunology problem and use engineering tools/approaches to solve. To grade this we will analyze the report in **3** **sections**: *significance*, *innovation*, and *approach*. We have provided guidelines to help establish an effective proposal and will use these criteria to grade proposals. To evaluate your report, ask yourself if your report answers each bulleted question below.

For the *Significance* Section—Did the student:

* Detail an important problem or a critical barrier to progress in the field
* Detail the impact on how people’s lives will be improved
* Describe gaps in knowledge/solutions in the field
* Describe how scientific knowledge, technical capability, and/or clinical practice could be improved
* Describe how successful completion of the aims change the concepts, methods, technologies, treatments, services, or preventative interventions that drive this field
* Show supporting data/graphics that highlight the significance of the problem
* Appropriately cites research

For the *Innovation* Section—Did the student:

* Challenge and seek to shift current research or clinical practice paradigms by utilizing novel theoretical concepts, approaches or methodologies, instrumentation, or interventions
* Specify whether the concepts, approaches or methodologies, instrumentation, or interventions are novel to one field of research or novel in a broad sense
* Delineate whether innovation is a refinement, improvement, or new application of theoretical concepts, approaches or methodologies, instrumentation, or interventions
* Provide comparisons to standard state-of-the art
* Describe why it is an appropriate time and feasible to pursue this idea now
* Show supporting data/graphics that highlight the innovation of the solution
* Appropriately cites research

For the *Approach* Section—Did the student:

* Describe overall strategy, methodology, and analyses appropriately to accomplish the specific aims of the project—with a focus on benchmarks for success
* Present strategies to ensure a robust and unbiased approach also addressing potential problems, and alternative strategies
* Present strategy to establish feasibility and manage particularly risky aspects
* Present adequate plans to address relevant biological variables, such as gender
* Give a timeline of studies or development for the project
* Show supporting data/graphics that highlight the approach and feasibility of the approach
* Appropriately cites research