**BENG491 Capstone Project I**

**Research Proposal Guideline**

A research proposal should cover three main points:

1) Explanation of proposed research (what will be done)

2) Methods and techniques to be employed (how it will be done)

3) Novelty and/or importance of the study (why it should be done)

**I. Project Title (2 pts)**

This should provide a specific insight of the proposed work

Example: Isolation and characterization of *X Enzyme* for …. (diagnostic, therapeutic, food industry...) Applications

**II. Research Proposal Abstract (10 pts)**

This is a brief description of the hypothesis and the goals of the experiment. It should indicate what questions you, as a researcher, will be trying to answer. An abstract provides a summary that allows readers to quickly assess the basic premise of your proposal. Your text should contain 200-300 words.

**III. Introduction and Literature Review (20 pts)**

You should begin with the basics of your research topic and then narrow the focus of those details that are especially pertinent to the proposed work. Present what is currently known by researchers, and how these discoveries were made. The importance of the topic of the project in the literature, its background, the current situation, the problems experienced, the gaps in the field, etc. should be clearly laid out. This is the place to show what is interesting and cutting-edge in the field that led to your research idea. You are laying the groundwork for your proposal with the material that you present.

* Textbooks and articles are the only sources which can be used in the introduction parts. Make sure to cite appropriately in the text (more to follow on citation). Never leave your reader in doubt as to the source of your information! Cite thoroughly and cite properly.
* This is the heart of your assignment and will probably be the lengthiest piece of it. Your sentence structure should look something like this:

• “According to Thullen et al. (1999), ….”

• “….. (Delwiche, 1981).”

**IV. Aim of the Work (10 pts)**

What is the hypothesis that you are testing? What are the questions that you seek to answer? Based on what is known in this field, explain what you expect to see and hope to show through your result? This is where you share your thoughts and justification.

**V. Material and Methods (40 pts)**

* It might be useful to construct an outline (work flow chart) before completing this section, what kind of experiments will you do. Separate those experiments into sections.
* In each experimental section describe your proposed experiment in depth. What processes are you going to use? What kind of equipment and supplies will be necessary for the project? What will you use for a negative or positive control (or both) . How many replicates will you have? What will be the experimental conditions? How will you calculate your yield?

**VI. Conclusion (10 pts)**

Your literature review will have already helped to lead the reader to an understanding of why your topic is of importance.

This is where you will state how your proposed research will advance knowledge. Will your study potentially have any social, economic impact? Let’s imagine you apply somewhere with this project and ask yourself why is it that your research deserves funding?

**VII. Bibliography (8 pts)**

We strongly recommend you to use citation tools for the bibliography part!

**Example:** Caspar T, Huber SC, Somerville C (1985) Alternation in growth, photosynthesis, and respiration in a starchless mutant of Arabidopsis thaliana (L.) deficient in chloroplast phyosphoglucomutase activity. Plant Physiol 79: 11-17