

Approval Form for Advanced Projects aka BME 4995 or "Research or Design for Credit"

This course consists of the design, execution and analysis of lab work, computational modeling, or theoretical analysis in a biomedical engineering subject area. Successful course enrollment and completion depends on following the below learning objectives, sign up procedures, and deliverables.

Course Learning Objectives: Student must have achieved learning in **at least three** of the objectives below:

1. Apply knowledge in cell or human physiology and math, computation, or engineering foundations to solve a biomedical engineering problem
2. Critically evaluate the literature that supports a stated hypothesis
3. Formulate a well-written, compelling, and novel hypothesis
4. Design experiments that test a novel hypothesis
5. Analyze generated data, assumptions, and caveats and argue for or against the given hypothesis

Sign-Up Procedure

1. Complete the BME 4995 Research-for-Credit form

- a. Form must be submitted EACH semester you plan to get credit for research.
- b. BME majors can count up to 3 credits toward a BME elective, and an additional 3 credits toward an unrestricted elective.
- c. For each credit hour earned, you must spend 3-4 hours/week working on the project, with a maximum of 10 hours/week for 3 credits.
- d. No student can earn BME 4995 credit for Capstone-related work (BME 4063 and 4064).
- e. If you will be working in a lab outside of BME, you usually must find a BME faculty co-advisor, ideally one who can contribute intellectually to your project. You can get some suggestions from your BME academic advisor. Exceptions are for faculty who have joint appointments in BME or have advised many BME students.

2. Attach a Project Proposal (1.5 page limit). This proposal should include:

- a. Project title and a brief description
- b. The purpose/objectives of your project
- c. The hypothesis of your project
- d. The planned experimental design for your project (experimental conditions, measurable outputs, etc.)
- e. The significance of the research (how will it impact the field?)

3. Attach the Project Expectations Statement (0.5 page limit). This statement should include:

- a. The days and times you are expected to work in the lab (or outside the lab as applicable)
- b. How often will you meet with your research mentor
- c. When you plan to submit your final deliverables for BME 4995 course credit

- d. Other expectations assigned by your mentor (examples include required background literature review, monthly progress reports, etc.)
- e. If working in a non-BME lab, how often will you meet with your BME co-advisor?

4. Sign up in SIS for the BME 4995 section with your BME research advisor. Contact Karen at kas2ue@virginia.edu if your advisor is not listed.

Deliverables due before final grades are posted (this may be dictated by the research advisor)

1. Project Report. This report should include:

- a. Background literature review relevant to the project
- b. A well-written, compelling and novel hypothesis
- c. A description of your experimental design approach and methodologies used
- d. A summary of your data analysis results, including limitations and assumptions
- e. A summary of the significance and impact of your work

2. Reflection Statement. A summary of how you integrated content from your courses (in math/computation, engineering, and physiology/cell biology) toward your project goals.

NOTE: Alternative deliverables to the Project Report as approved by the research advisor: Examples: oral/poster presentation, prototype, provisional filing, authorship on a paper

Grading

Your research advisor (and co-advisor if applicable) will use the Project Report and their experiences working with you on this project to assign a grade.