BME 495 – Honors Independent Research

An independent research project with faculty supervision, including experimental, analytical, or numerical simulation research or prototype fabrication of a design that will serve as the basis for the Honors Thesis.

Prerequisites: BME 494; U4 status, cumulative GPA of 3.5/4.0; permission of instructor and department.

To satisfy graduation with Honors in BME, this course must be taken for 3 credits, twice, with 3 credits in the Fall and 3 credits in the Spring semesters of the U4 year.

BME 495 Outcomes (ABET):

(a) an ability to apply knowledge of advanced mathematics, science, biology, physiology, biotechnology, and engineering

(b) an ability to design and conduct experiments from living and non-living systems, as well as to analyze and interpret data

(d) an ability to function on multi-disciplinary teams

(g) an ability to communicate effectively

Outcome Measures:

Laboratory Notebook. Each student must maintain a laboratory notebook that follows the standards for that laboratory (e.g., for computational/numerical simulations projects, a periodic progress may be required). (b) With Research Supervisor approval, that book may be copied by the student; however, the book is retained by the laboratory.

Honors Thesis Report. The written report will be at least 20 pages in length, and will include a detailed description of the project, including an abstract, background introduction to the problem, methodology or approach taken (a,b,g), the progress (data) the student made independently and the progress of the total project (d), as well as a final summary statement of the student’s perceived experience; the cover page and reference list are additional pages. The written report will be due the last day of regular classes, otherwise a grade of I, incomplete, will be assigned. A copy of this report will be sent to both the Undergraduate Program Director and Undergraduate Program Coordinator. For Fall semesters, the Report is a preliminary Thesis; for Spring semesters, the Report is a final Thesis and should be a revision of the Fall version.

Honors Thesis Defense. The oral defense is a component of the Spring semester and involves a PowerPoint presentation to the mentor that is open to the public. The oral defense will target either a scientific meeting audience (for research proposals) or angel investor audience (for design prototypes). This defense must be presented the week before the final week of classes during the Spring semester.

Other Outcome Measures. Attendance/Promptness, Level of Engagement In Laboratory Projects, Behavior / Teamwork, General Knowledge (a,b,d).

Grading:

At the end of the Fall semester, the faculty supervisor will grade the lab notebook, engagement level, behavior, general knowledge and thesis draft based on a rubric. At the end of the Spring semester, the faculty supervisor will grade the lab notebook, engagement level, general knowledge, written thesis and oral defense based on a rubric. For each of 5 items, the instructor will assign a numerical score of 1 through 4 where 1 is unsatisfactory and 4 is exemplary. Thus a total of 20 points are available. The grading rubrics are on the following pages.