

BME 494 – Honors Seminar on Research

Course Description: This 1 credit seminar course is open to U3 BME majors who are completing a B.E. in BME with Honors; BME 494 precedes BME 495 Honors Independent Research in BME, and is taken with the same faculty member as BME 495. The course outlines components of biomedical research vs design that includes experimental design, data recording, analysis and presentation at scientific meetings, as well as engineering design schematics, patents, and presentations to angel investors. The course culminates with an Honors Thesis Proposal that follows either a research (hypothesis testing) or design (prototype construction) pathway. This course is applied towards engineering technical elective credit.

Prerequisites: BME major, U3 standing

This course is taken for 1 credit.

BME 494 Student Outcomes (ABET):

(6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions.

Outcome Measures:

Discussion with mentor. The course is taught by the student's prospective research advisor for the Honor's Thesis (BME 495). Reading materials will be discussed in weekly meetings where the mentor will evaluate the level of engagement of the student using a rubric.

Homework examples will be provided to the student regarding experimental design, technical communication.

Honors Thesis Proposal. There is both a written and oral report. The written report will be 5-10 pages in length and will include elements of a simple grant proposal including an executive summary/abstract, background, experimental design with proposed statistical analysis, and critical analysis of potential outcomes and pitfalls. The oral report will be presented in PowerPoint format to the mentor targeting either a scientific meeting audience (for research proposals) or angel investor audience (for design prototypes).

Grading:

At the end of the semester, the faculty supervisor for the honors seminar will grade the engagement level, homework and thesis proposal (written separate from oral) based on a rubric. For each of 4 items, the instructor will assign a numerical score of 1 through 4 where 1 is unsatisfactory and 4 is exemplary. Thus a total of 16 points are available.

The grading rubric is attached; it must be completed and emailed to the Undergraduate Program Coordinator.

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Student:

PI:

Date:

Item	Unsatisfactory 1	Developing 2	Satisfactory 3	Exemplary 4	Points
Discussion	Not prepared or engaged	Somewhat prepared but struggling with discussion	Prepared and engaged yet does not take ownership of material	Prepared, engaged and takes ownership of material	
Homework	Incomplete, show lack of effort	Completed in hasty fashion	Complete	Complete and shows insight into deeper issues	
Thesis Proposal - Written	Incomplete	Complete but superficial	Complete and shows some insight	Complete and insightful of outcomes and pitfalls	
Thesis Proposal – Oral	Incomplete	Complete but not clear	Complete and adequate presentation, but not able to answer questions	Complete, excellent presentation and fielding of questions	

Grading Scale:

Total Points:

15-16: A

13-14: A-

12: B+

11: B

10: B-

8-9: C+

6-7: C

<6: C-