

All BME 499 credits taken with a Non-BME faculty member must be approved by the Undergraduate Program Director, Dr. Frame. To get this approval:

1. The BME undergraduate student must find a suitable laboratory and faculty mentor.
2. The BME undergraduate student must write a paragraph describing the project. That paragraph is emailed to Dr. Frame (mframe@notes.cc.sunysb.edu), Jessica Kuhn (UG Program Coordinator, Jessica.Kuhn@stonybrook.edu) and the lab mentor. The lab mentor must confirm by email to Dr. Frame that they agree to this project.
3. Dr. Frame will evaluate the engineering content of the project; this is necessary for ABET. If sufficient, permission will be given.
4. The lab mentor must agree to the BME 499 grading policy, per the BME 499 syllabus below, and must tell Dr. Frame how many credits to assign to the student.
5. Jessica Kuhn then permits the BME student to enroll in BME 499 with Dr. Frame (Instructor McMahon).
6. At the end of the semester, the lab mentor assigns a grade for the student, informing Dr. Frame by email.
7. Note that part of the grade is a mandatory paper. This is NOT necessarily a scientific paper because it includes the student's perceived experiences (see below). That paper must be emailed to Jessica Kuhn and Dr. Frame by the last day of regular classes. Failure to submit this paper will result in an Incomplete grade.
8. After Dr. Frame gets the grade and the paper, the grade is entered to SOLAR.

Course Title: BME 499 Independent Research

Course Description: An independent research project with faculty supervision.

Prerequisites: B average in all science courses; permission of instructor and department.

0-3 credits. [1 credit hour per 3 hours in the lab.]

Specific Information:

ABET (BME) Program Outcomes

- 1 an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics.
- 5 an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives.
- 6 an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgement to draw conclusions.

Outcome Measures:

Attend mandatory meeting with the Undergraduate Program Director: The meeting will be held as a group with other BME 499 enrollees immediately after the add/drop deadline. Expectations and the process of completing BME 499 will be discussed. Failure to attend this meeting means you will have an incomplete in BME 499.

Laboratory Notebook. Each student must maintain a laboratory notebook that follows the standards for that laboratory. With Research Supervisor approval, that book may be copied by the student, however, the book is retained by the laboratory. This addresses (1) and (6). Item (5) will be addressed by overall laboratory performance.

End of semester report. This report will be 5 pages in length for each credit hour enrolled. The end of semester report will include a detailed description of the project, including an abstract, background introduction to the

problem, methodology or approach taken (1,6), the progress the student made independently and the progress of the total project (5), and a final summary statement of the student's perceived experience. This report will be due by the last day of regular classes, otherwise a grade of I, incomplete, will be assigned. A copy of this report will be sent to the undergraduate program director. Note that this report is not intended to be a finished summary of the science, but instead a documentation of work done in the lab and research experience gained by the student. All students are required to submit an abstract and present a poster at URECA.

Grading. At the end of the semester, the faculty supervisor for the independent research will grade both the laboratory notebook and laboratory performance, and the written report based on how well these measures meet the Program Outcomes. For each item, the instructor will assign a numerical score of 1 through 4 where 1 is unsatisfactory and 4 is excellent. A total of 24 points are possible. The grading cut-off is listed on the rubric (page 2).

Please complete the BME 499 Permission form:

<https://www.stonybrook.edu/commcms/bme/undergraduate/courses.php>.

Page 2 contains the rubric for BME 499.

Student:

PI:

Date:

	Unsatisfactory 1	Developing 2	Satisfactory 3	Exemplary 4	Points
Paper	Very little relevant information is included in the paper. The paper is poorly written and organized.	Some relevant information is included. Writing skills need improvement.	Most of the relevant information is included. The paper is generally well written but could be written and organized more effectively.	Almost all of the relevant information is included. The paper is well written and organized with only minor weaknesses.	_____
Laboratory Notebook / Progress Report	The notebook is absent or unintelligible	The lab notebook has only two to three entries. Information is difficult to extract.	There are numerous entries and most of the required information is included.	Entries exist for all of times the student attended the lab and all of the information required to repeat the experiments is included.	_____
Attendance / Promptness	Student is late to lab on a regular basis	Student is late to lab more than three times .	Student is late to lab two or three times but generally comes to lab as agreed.	Student is always prompt and comes to lab at the times/dates agreed upon.	_____
Level of Engagement in Laboratory Projects	Student never offers ideas or asks questions regarding the project.	Student rarely offers ideas or asks questions regarding the project.	Student sometimes contributes to the project by offering ideas and asking questions.	Student frequently asks questions about the project and is actively engaged in troubleshooting by offering ideas and suggestions.	_____
Behavior / Teamwork	Student almost never is courteous and appropriate in interactions with peers and supervisor in the lab.	Student occasionally is courteous and appropriate in interactions with peers and supervisor in the lab.	Student usually is courteous and appropriate in interactions with peers and supervisor in the lab.	Student almost always is courteous and appropriate in interactions with peers and supervisor in the lab.	_____
General Knowledge	Student does not read relevant scientific papers and lacks a clear understanding of their specific project and its relevance to larger questions in the general field of study	Student reads relevant scientific papers and has a rudimentary understanding of their specific project and its relevance to larger questions in the general field of study	Student reads relevant scientific papers and has a solid general understanding of their specific project and its relevance to larger questions in the general field of study	Student reads relevant scientific papers and has a clear conceptual understanding of their specific project and its relevance to larger questions in the general field of study	_____

Grading Scale:

22-24: A

18-19: B+

12-13: C+

<8: D

20-21: A-

16-17: B

10-11: C

14-15: B-

8-9: C-

Total Points: