BENG 1000 Introduction to Undergraduate Research and Design

Instructors: Dr. Elizabeth Vargis. Contact via Canvas.

Teaching Assistants: Taylor Eggertsen, Emily Burgett, Gabby Nielson, AJ Walters

Textbook: (none) All material will be available electronically via Canvas.

Location: ENGR 205

Class times: Tuesdays or Thursdays 9:00 – 9:50 am. (Please attend the section in which you are registered; if you do have a conflict or miss a class you may attend the other section that week, however, the classroom is close to capacity on both days)

Course overview: This course is an introduction **to research and engineering design** in *Biological Engineering* that will prepare students for subsequent lab-intensive courses and in particular, their Capstone Research Project (Senior Thesis) in this major. **This course is intended for Biological Engineering Majors.** Students will gain familiarity with the research facilities and faculty research programs in Biological Engineering at USU. This is a hands-on class that will provide specific skills in searching scientific literature, design of controlled experiments, faculty research overviews, data analysis, and data presentation.

Who should take this course: This is a required course for Biological Engineering Students. It is designed to provide students with fundamental research and design skills, preparing them for a rigorous curriculum centered on hands-on learning. This course is the first in a sequence of core courses that prepare students for independent research and design projects, culminating in a team capstone design project.

Course Fee: $55
These fees pay for laboratory supplies, equipment maintenance, and teaching assistants.

ABET Course Outcomes
C: An ability to design a system, component, or process to meet desired need within realistic constraints.
F: An understanding of ethical and professional responsibility.

IDEA Course Evaluations
Objective 4: Developing specific skills, competencies,and points of view needed by professionals in the field most closely related to this course
Objective 9: Learning how to find and use resources for answering questions or solving problems

Grading:

- Assignments, surveys, labs 80%
- Final project (poster & proposal) 10%
- Participation and attendance 10%

At a minimum, the *University Grading Scale*: will be used for this course:
A 100-93%, **A-** to 90%, **B+** to 87%, **B** to 83%, **B-** to 80%, **C+** to 77%, **C** to 73%, **C-** to 70%, **D** to 60%, **F** below 60%.

Course material will be available through Canvas. All material is **submitted through the Canvas assignment tool and will be due Friday by 5pm the following week**. The rigidity of deadlines and submission procedures is part of daily life in science and engineering research where funding proposals, publications, and patent applications may all be disqualified if improperly submitted or submitted late. So please submit assignments on time. **Late assignments will not be accepted!** These assignments are commensurate with a 1-credit, first-year course in engineering.

Course policies: No cell phone use during class. Laptops may be used to take notes, read course material, search for topics, etc. pertaining to class (no emailing, social media, etc.). Treat the instructor and invited speakers as you would want to be treated if you were lecturing.

Ethical conduct: Students are expected to abide by the rules of conduct expected of all university students. Assignments and lab reports must reflect individual effort; however, students are encouraged to form study groups and work as teams. This does not mean copying work, rather outline approaches together and work solutions individually, then compare results. Failure to properly cite sources is plagiarism. **Be certain not to cut and paste material from the Internet for your lab reports and assignments. Be certain to properly reference (cite) materials (graphs, pictures, tables, videos) used for your presentations. Cite the primary literature (refereed journal articles); do not cite Wikipedia.**

Course Schedule (subject to change—check Canvas Calendar)

Week Dates	Topic	Assignment / Lab
1 Aug 30 Sept 1	Course Overview, Reporting Expectations, Biological Engineering Major with Katherine Grover	**A1**: Background survey Tuesday: Read Lab Prelab
2 Sept 6 Sept 8	Tuesday: **Intro Lab in EL 223** Thursday: How to get involved in research in Biological Engineering, Undergraduate Research with Scott Bates; Study Strategies (Academic Resource Center)	Thursday: Read Lab Prelab
3 Sept 13 Sept 15	Tuesday: How to get involved in research in Biological Engineering, Undergraduate Research with Scott Bates; Study Strategies (Academic Resource Center) Thursday: **Intro Lab in EL 223**	**A2**: Lab Report & Prelab
September 19: Last Day to Drop Classes without Notation on Transcript		

4 Sept 20 Sept 22	BE faculty research overviews	
5 Sept 27 Sept 29	BE faculty research overviews	**A3**: Research Resume
6 Oct 4 Oct 6	BE faculty research overviews	**A4**: Group Projects Idea
7 Oct 11 Oct 13	BE Industry overviews	**A5**: Final Project Proposal Abstract, Read Prelab
8 Oct 18 Oct 20	**FALL BREAK: No Class Tuesday or Thursday**	
9 Oct 25 Oct 27	Design Heuristics and Ethics	**A6**: Design Heuristics, Read Prelab
October 31: Last Day to Withdraw from Classes (W on transcript)		
10 Nov 1 Nov 3	Lab 1: **Bio Lab in EL 223**	**A7**: Lab report+Prelab Read Prelab
11 Nov 8 Nov 10	Lab 2: **Engineering Lab in EL 223**	**A8**: Lab report+Prelab
12 Nov 15 Nov 17	Problem Solving for Biological Engineers Group work for Final	**A9**: Mass balance
13 Nov 22 Nov 24	**THANKSGIVING: No Class Tuesday or Thursday**	
14 Nov 29 Dec 1	Problem Solving for Biological Engineers Group work for Final	**A10**: Problem set
15 Dec 6 Dec 8	Course Wrap Up, IDEA Evaluations Group work for Final	**Final Due 12/16**

*Assignments due following week on Friday after assigned unless stated. Lab are designed to introduce students to key methods and techniques within the constraints of a 1-credit course.

Academic Integrity – "The Honor System"

Each student has the right and duty to pursue his or her academic experience free of dishonesty. The Honor System is designed to establish the higher level of conduct expected and required of all Utah State University students.

The Honor Pledge: To enhance the learning environment at Utah State University and to develop

student academic integrity, each student agrees to the following Honor Pledge: "I pledge, on my honor, to conduct myself with the foremost level of academic integrity." A student who lives by the Honor Pledge is a student who does more than not cheat, falsify, or plagiarize. A student who lives by the Honor Pledge:

- Espouses academic integrity as an underlying and essential principle of the Utah State University community;
- Understands that each act of academic dishonesty devalues every degree that is awarded by this institution; and
- Is a welcomed and valued member of Utah State University.

Plagiarism
Plagiarism includes knowingly "representing, by paraphrase or direct quotation, the published or unpublished work of another person as one's own in any academic exercise or activity without full and clear acknowledgment. It also includes the unacknowledged use of materials prepared by another person or agency engaged in the selling of term papers or other academic materials." The penalties for plagiarism are severe. They include warning or reprimand, grade adjustment, probation, suspension, expulsion, withholding of transcripts, denial or revocation of degrees, and referral to psychological counseling.

Students with Disabilities
The Americans with Disabilities Act states: "Reasonable accommodation will be provided for all persons with disabilities in order to ensure equal participation within the program. If a student has a disability that will likely require some accommodation by the instructor, the student must contact the instructor and document the disability through the Disability Resource Center (797-2444), preferably during the first week of the course. Any request for special consideration relating to attendance, pedagogy, taking of examinations, etc., must be discussed with and approved by the instructor. In cooperation with the Disability Resource Center, course materials can be provided in alternative format, large print, audio, diskette, or Braille."

Withdrawal Policy and "I" Grade Policy
Students are required to complete all courses for which they are registered by the end of the semester. In some cases, a student may be unable to complete all of the coursework because of extenuating circumstances, but not due to poor performance or to retain financial aid. The term 'extenuating' circumstances includes: (1) incapacitating illness which prevents a student from attending classes for a minimum period of two weeks, (2) a death in the immediate family, (3) financial responsibilities requiring a student to alter a work schedule to secure employment, (4) change in work schedule as required by an employer, or (5) other emergencies deemed appropriate by the instructor.