BENG 1000 Introduction to Undergraduate Research and Design

Instructor: Dr. Elizabeth Vargis. Office hours: Tuesdays 10-11, alternating Fridays 10:30-11:30 starting 9/1/17. Contact via Canvas.

Teaching Assistants: Emily Burgett, Morgan Bishop, Ivy Hansen, Caleb Walker

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 have a conflict or miss a class you may attend the other section that week, however, the classroom is at 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. **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 hands-on class 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 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 and 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 (see schedule for exceptions) by 5pm the following week**. The rigidity of deadlines and submission procedures is part of the daily life in science and engineering research where proposals, publications, and patent applications may not be accepted if improperly submitted or submitted late. So please submit assignments on time. **Late assignments will not be accepted!** These assignments are not difficult and are commensurate with a 1-credit, first-year course in engineering.

All homework will only be accepted in PDF format. Please scan your homework with the correct orientation and at a high quality and submit via Canvas to ensure quick and accurate grading. Scanners are available for free in the library.

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. **DO NOT cut and paste material from the Internet for your lab reports and assignments. Properly reference materials (graphs, pictures, tables, videos) you use. 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 29 Aug 31	Course overview, Life after Biological Engineering, the Biological Engineering Major	**A1**: Background survey (due **M** 9/11, 5pm)
2 Sept 5 Sept 7	Undergraduate Research Opportunities with Dr. Scott Bates	
3 Sept 12 Sept 14	BE faculty research overviews	
September 18 (5:00 PM) Last Day to Drop Classes without Notation on Transcript		
4 Sept 19 Sept 21	Career Services	Read Lab 1 Prelab **A2:** Research Resume (due F 9/29, 5pm)
5 Sept 26 Sept 28	Design Heuristics	**A4**: Design Heuristics (due F 10/20, 5pm)

6 Oct 3 Oct 5	Lab 1**: Intro Lab in EL 223**	**A3:** Lab 1 Report and Prelab (due F 10/13, 5pm)
7 Oct 10 Oct 12	BE faculty research overviews	**A5**: Group Projects Idea (due F 10/27, 5pm)
8 Oct 17 Oct 19	**FALL BREAK: No Class Tuesday or Thursday**	
9 Oct 24 Oct 26	BE industry research overviews	Read Lab 2 Prelab **A6**: Final Project Proposal (due 11/3, 5pm)
October 30 Last Day to Withdraw from Classes (W on transcript)		
10 Oct 31 Nov 2	Lab 2: **Bio Lab in EL 223**	Read Lab 3 Prelab **A7**: Lab 2 report and Prelab (due 11/10, 5pm)
11 Nov 7 Nov 9	Lab 3: **Engineering lab in EL 223**	**A8:** Lab 3 report and Prelab (due 11/17, 5pm)
12 Nov 14 Nov 16	Problem solving for biological engineers	**A9**: Mass balance (due **M** 11/27, 5pm)
13 Nov 21 Nov 23	**THANKSGIVING: No Class Tuesday or Thursday**	
14 Nov 28 Nov 30	Problem solving for biological engineers Ethics in Biological Engineering	**A10:** Problem set (due 12/8 5pm)
15 Dec 5 Dec 7	Course summary, IDEA Evaluations Group work for final	**Final due 12/14, 12pm**

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 used 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.