

Biological Engineering Design I

ABE 4042C Section DES1

Class Periods: Wednesday, Period 7 (1:55 PM - 2:45 PM); Friday, Period 7 - 8 (1:55 PM - 3:50 PM)

Location: Rogers 110

Academic Term: Fall 2023

Instructors:

Richard V. Scholtz, III

Rogers 107

rscholtz@ufl.edu

352-294-6704 and 352-339-1751

Office Hours: Wednesday, and Friday - Period 3 and 5 (9:35 am – 12:35 pm), or by appointment. Contact via email to setup a Zoom or Teams Connection.

Ziynet Boz

Rogers 105

ziynetboz@ufl.edu

352-294-7690

Office Hours: TBD

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

- Name, email address, office location, office hours
- Name, email address, office location, office hours

Course Description

2 credits. Design of engineered agricultural and biological systems and devices. Problem definition analysis, synthesis, project management, economic, environmental and social impacts. Individual and team projects. (Offered Fall).

Course Pre-Requisites / Co-Requisites

2012C: Introduction to Biological Engineering

Course Objectives

The objective of this course is to introduce students to the techniques of the engineering design process. Students who complete this course will have demonstrated an understanding of the engineering design process from problem definition to finished product. Students will learn to:

- develop specific design objectives and criteria from poorly defined needs descriptions
- gather and evaluate design information,
- conceptualize designs to meet objectives and criteria,
- evaluate designs,
- develop and document designs,
- work in teams,
- manage design projects and
- communicate design needs and accomplishments with clients, peers, suppliers, and managers.

Relation to Program Outcomes (ABET):

This course contributes two (2) credit hours toward meeting the minimum 48 credit hours of Engineering Topics in the basic-level curriculum for the Bachelor of Science Degree in Agricultural and Biological Engineering.

Outcome	Coverage*
1. An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics	High

2. An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors	High
3. An ability to communicate effectively with a range of audiences	High
4. An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts	High, Assessed
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	High
6. An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions	High, Assessed
7. An ability to acquire and apply new knowledge as needed, using appropriate learning strategies	Medium

*Coverage is given as high, medium, or low. An empty box indicates that this outcome is not covered or assessed in the course.

Recommended Materials

- Christianson, L. & R. Rohrbach. 1986. Design in Agricultural Engineering. American Society of Agricultural Engineers. St. Joseph, MI. 312 pages.
- Dym, C. & P. Little. 2008. Engineering Design: A Project Based Introduction. Third Edition. John Wiley & Sons, Inc. New York. 352 pages.
- Eide, Arvid R., Roland D. Jenison, Lane H. Mashaw and Larry L. Northup. Engineering Fundamentals and Problem Solving (2nd Ed.). McGraw-Hill, Inc., New York. 492 pp.
- Pahl, G., W. Beitz & J. Feldhusen. 2007. Engineering Design: A Systematic Approach. Third Edition. Springer-Verlag New York, LLC. New York. 617 pages.
- Petroski, H. 1998. Invention by Design: How Engineers Get from Thought to Thing. Harvard University Press. Cambridge, MA. 256 pages.
- Voland, G. 2003. Engineering By Design. Prentice Hall. Second Edition. New York. 575 pages.

Course Outline

- Introduction
- Learning from Failure/Failure Modes and Effects
- Design
- Planned Creativity
- Resources
- Communication
- Standards, Specifications and Documentation
- Testing and Evaluation
- Synthesis and Analysis
- Teamwork and Management
- Conflict Resolution
- Project Scheduling/Time Management
- Manufacturing
- Materials, and Components
- Safety and Liability
- Cost Estimation and Economy
- Common Engineering Business Practices

Course Schedule

See Canvas for Scheduled Lectures, Laboratory Exercises, Discussions, and Deliverable Deadlines

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance is required – Lectures will cover material from various references, so it is imperative that students make every effort to attend classes and take good notes. Students are especially encouraged to ask questions during lectures. A part of some class periods will be used for teams to meet and coordinate their projects. Teams will maintain a record of attendance within the team electronic design notebook, which will be factored in individual student project grades.

All deliverables will comply with the published project requirements and due date specified at the time of assignment (no deliverable will be due earlier than 3 business days after assignment). **No late deliverable will be accepted**, it is incumbent of each student to make proper arrangements regarding any time-conflict (see make-up policy below).

The student is expected to manage their time efficiently and should anticipate spending three times the length of lectures studying and preparing deliverables outside the classroom. The student should focus on the following: assignments, preparing both design and laboratory reports, review of notes and lecture materials, and assigned readings.

The arrangements for make-up assignments should be made before the date in question unless there is an emergency situation. In which, reviews will be on a case by case basis. Excused absences must be consistent with university policies. Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies. Click here to read the university attendance policies:

<https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

Evaluation of Grades

Assignment	Total Points	Percentage of Final Grade
Self-Assessments and Homework Assignments.	1-5	5%
Project 1	150	15%
Needs Statement and Literature Review	50	
Source Code	40	
Presentation	60	
Project 2 -	400	40%
Device	60	
Source Code	30	
Presentation	80	
Report	160	
Operating Instructions	20	
Construction Instructions	20	
Teamwork Assessment	30	
Project 3 -	400	40%
Capstone Deliverable Agreement	20	
Capstone Proposal Presentation	100	
Capstone Proposal Video	80	
Capstone Proposal Report	170	
Teamwork Assessment	30	
		100%

There will be three design projects throughout the semester, worth 15%, 40% and 40%. Details will be specified at for each project will be supplied at the conclusion of each prior project. Students will be required to maintain digital copies of all materials for their team digital portfolio. Teamwork assessment grades will be modified relative team and self-assessment forms, and team member attendance logs maintained in the team digital notebook.

Grading Policy

Percent	Grade	Grade Points
91.0- 100	A	4.00
89.0 – 90.9	A-	3.67
87.0- 88.9	B+	3.33
81.0 - 86.9	B	3.00
79.0 – 80.9	B-	2.67
77.0 - 78.9	C+	2.33
71.0 – 76.9	C	2.00
69.0 - 70.9	C-	1.67
67.0 - 68.9	D+	1.33
61.0 - 66.9	D	1.00
59.0 - 60.9	D-	0.67
0 - 58.9	E	0.00

More information on UF grading policy may be found at:
<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.ua.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

In-Class Recording

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by

a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

University Honesty Policy

Students should also strive to think and act as professionals, an idea that is embodied by the Engineering Code of Ethics. Students should extend all guests both professional and common courtesy. The instructor reserves the right to assess penalty points toward the class, or toward individuals who have chosen to disregard these guidelines.

Students will be strictly held to the University of Florida's policy on Academic Honesty. Suspected violations will result in no points awarded (failure) for the deliverable, and the offending student will be referred to the Dean of Students Office and Office of Student Judicial Affairs. Dropping or replacing the lowest grade will not be an option in these cases. All disputes regarding the suspected infraction will be handled by the Student Judicial Affairs according to Regulations of the University of Florida.

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment." The Honor Code (<https://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Commitment to a Safe and Inclusive Learning Environment

The Herbert Wertheim College of Engineering values varied perspectives and lived experiences within our community and is committed to supporting the University's core values, including the elimination of discrimination. It is expected that every person in this class will treat one another with dignity and respect regardless of race, creed, color, religion, age, disability, sex, sexual orientation, gender identity and expression, marital status, national origin, political opinions or affiliations, genetic information, and veteran status.

If you feel like your performance in class is being impacted by discrimination or harassment of any kind, please contact your instructor or any of the following:

- Your academic advisor or Graduate Program Coordinator
- HWC OE Human Resources, 352-392-0904, student-support-hr@eng.ufl.edu
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, taylor@eng.ufl.edu
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, nishida@eng.ufl.edu

Software Use

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <https://registrar.ufl.edu/ferpa.html>

Campus Resources:

Health and Wellness

U Matter, We Care:

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Counseling and Wellness Center: <https://counseling.ufl.edu>, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Discrimination, Harassment, Assault, or Violence

If you or a friend has been subjected to sexual discrimination, sexual harassment, sexual assault, or violence contact the **Office of Title IX Compliance**, located at Yon Hall Room 427, 1908 Stadium Road, (352) 273-1094, title-ix@ufl.edu

Sexual Assault Recovery Services (SARS)

Student Health Care Center, 392-1161.

University Police Department at 392-1111 (or 9-1-1 for emergencies), or <http://www.police.ufl.edu/>.

Academic Resources

E-learning technical support, 352-392-4357 (select option 2) or e-mail to Learning-support@ufl.edu.
<https://lss.at.ufl.edu/help.shtml>.

Career Connections Center, Reitz Union, 392-1601. Career assistance and counseling; <https://career.ufl.edu>.

Library Support, <http://cms.uflib.ufl.edu/ask>. Various ways to receive assistance with respect to using the libraries or finding resources.

The Agricultural & Biological Engineering Department has a designated librarian to support your research needs. Amy Buhler is our liaison librarian for all things related to our profession. You are welcome to reach out and schedule an appointment abuhler@ufl.edu. Here is a link to the library's subject guide to Agricultural & Biological Engineering: <https://guides.uflib.ufl.edu/abe>

This course has a its own course guide at: <https://guides.uflib.ufl.edu/ABE4042C>

Teaching Center, Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.
<https://teachingcenter.ufl.edu/>.

Writing Studio, 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.
<https://writing.ufl.edu/writing-studio/>.

Student Complaints Campus: <https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>; <https://care.dso.ufl.edu>.

On-Line Students Complaints: <https://distance.ufl.edu/getting-help/>; <https://distance.ufl.edu/state-authorization-status/#student-complaint>.