

ABE 3000C
APPLICATIONS IN BIOLOGICAL ENGINEERING

1. Catalog Description: 3 credits. Lecture 2 hours with a 3 hour lab.

This course provides an overview of the research and applications of Biological Engineering such as bioprocessing, biotechnology, transport processes, biosensors, bioremediation, biological materials, and biomedicine. Hands-on experiments and course projects are required. This course has two, one-hour lectures and a three-hour lab. (Offered Spring)

2. Pre-requisites and Co-requisites: This course requires a junior-level standing in engineering or permission of both the instructor and the Agricultural and Biological Engineering Department. It is also expected that the student has basic courses in calculus, chemistry, physics and biology.

3. Course Objectives:

- Gain fundamental knowledge about the terminology, equipment, and recent advances in the fields of biotechnology, biomedicine, bioremediation, and bioprocessing.
- Develop skills to identify, formulate, and solve problems in biological engineering.
- Understand the impact of biological engineering in a global and societal context.
- Develop skills in using modern engineering tools necessary for the practice in the biological engineering field.
- Develop skills in written and oral communication.
- Understand the importance of life-long learning.

4. Contribution of course to meeting the professional component for ABET:

This course contributes 3 credit hours toward meeting the minimum 48 credit hours of Engineering Topics in the basic-level curriculum for the Bachelor of Science Degree in Biological Engineering.

5. Relationship of course to ABET program outcomes (1-7): This course addresses outcomes 2,3,4,5,6, and 7 but assesses outcomes 3, 4 and 7.

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
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
3. an ability to communicate effectively with a range of audiences
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
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

judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

- 6. Instructor:** Dr. Melanie Correll
 a. Office location: 209 Rogers Hall
 b. Telephone: 352-294-6722
 c. E-mail address: correllm@ufl.edu
 d. Office hours: Tuesday noon – 1: 30 pm or arranged via email
- 7. Teaching Assistant:** TBD
- 8. Meeting Times:** MWF (10:40-11:30 am) and Labs-Section 049D (W,11:45 am-2:45pm) and Section 4148 (F,10:40am-1:40pm)
- 9. Class/Laboratory Schedule:** See TENTATIVE SCHEDULE
- 10. Meeting Location:** Lectures: Room 129 and Labs: Room 142 Frazier Rogers Hall except when noted, Field trip locations vary by year
- 11. Material and Supply Fees:** as noted
- 12. Textbooks and Software Required:**
 Title: Basic Laboratory Methods for Biotechnology
 Authors: Lisa A. Seidman and Cynthia J. Moore
 Date: November 2008
 ISBN: 0321570146
 Publisher: Benjamin Cummings
- 13. Recommended Reading:** will be provided
- 14. Course Outline (the order of these topics may change based on lab/field trip schedules):**

Week	Topics
1	Introduction- Biology in Biological Engineering
2	Safety, Regulation, Documentation, Products to Market in Biotechnology
3	Basics in Laboratory Equipment
4	Biotechnology- Genetic Engineering- Cell Culture
5	Assays-B-gal Enzymes
6	Process Scale up (Bench to Market)
7	Industry Application Food Engineering
8	Bioseparations (CHASM)
9	Protein Purification
10	Reclamation and Bioremediation
11	Tissue Engineering
12	Biosensors types and designs
13	Biofuels/Biofilms
14	Creative Projects
15	Creative Projects

15. Attendance and Expectations:

Students are expected to arrive on time and attend all classes and labs. Students are expected to read assignments and TAKE NOTES within lab notebook as guided on the lab notebook best practices. Cell phone use is not allowed during class. Homework assignments are due in class on the day specified for full credit a 10% deduction until the start of the next class, a 20% until the start of the second class day after assignment due date, and a 30% deduction will be given until the start of the third class day following the assignment due date (no further assignments will be accepted). Late assignments will only be accepted three class days after the assignment is due except for UNIVERSITY EXCUSED ABSENCES. Students are expected to participate in discussion and have read assigned readings prior to lab or class.

16. Grading: Homework (10%); Lab Notebook (5%); Lab reports (35%); Three within semester exams (10% each total=30%); Final Project (10%); Final Exam-cumulative (10%); total: 100%

17. Grading Scale: 93.5-100 = A, 89.5-93.4 = A-, 87.5-89.4 = B+, 83.5-87.4 = B, 79.5-83.4 = B-, 77.5-79.4 = C+, 73.5-77.4 = C, 69.5-73.4 = C-, 67.5-69.4 = D+, 63.5-67.4 = D, 59.5-63.4 = D-, <59.4 = E.

18. Make-up Exam Policy: No make-up exams will be given except for valid medical reasons or prior arrangements have been made.

19. Honesty Policy – All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others.

20. Accommodation for Students with Disabilities – Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation.

21. UF Counseling Services – Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

- University Counseling Center, 301 Peabody Hall, 392-1575, Personal and Career Counseling.
- SHCC mental Health, Student Health Care Center, 392-1171, Personal and Counseling.
- Center for Sexual Assault/Abuse Recovery and Education (CARE), Student Health Care Center, 392-1161, sexual assault counseling.
- Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

22. Software Use – All faculty, staff and student 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.

23. Commitment to a safe and inclusive learning environment

The Herbert Wertheim College of Engineering values broad diversity within our community and is committed to individual and group empowerment, inclusion, and the elimination of discrimination.

It is expected that every person in this class will treat one another with dignity and respect regardless of gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture.

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
- Robin Bielling, Director of Human Resources, 352-392-0903, rbielling@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@ufl.edu

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

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting 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