

ABE 2062 Biology for Engineers

ABE 2062 Section 25711

Class Periods: M, W, F | Period 6 (12:50 PM – 1:40 PM)

Location: FLG 220 (In-person) or [Zoom \(Online\)](#)

Academic Term: Fall 2021

Instructor:

Prof. Piyush K. Jain

(feel free to call me Dr. Jain)

jainp@ufl.edu

352-294-7012

(email is the preferred mode of communication)

Office Hours*: W (2:00-3:45 PM) via zoom

(*Please note that the office hour timings are subject to changes to accommodate everyone.)

Teaching Assistant/Peer Mentor/Supervised Teaching Student:

Please contact through the Canvas website

- None, currently

Course Description

This is a 3-credit introductory biology course for students in the engineering discipline to develop their engineering career in a bio-related field. The contents of the course include the basic knowledge of biological functions of human at the organ, tissue, cellular, and molecular levels.

Course Pre-Requisites / Co-Requisites

None

Course Objectives

Each lecture will have specific learning objectives that will be announced at the beginning of that lecture. Broadly, at the end of this course, a student should be able to do the following:

- 1) Have basic knowledge of broad interdisciplinary fields of biology for career development.
- 2) Understand the structure, function of biological systems.
- 3) Analyze the common challenges in biology and how engineering is applied in biology and biotechnology.

In addition to these learning objectives, the assignments and projects will be implemented that will be based on real world problems or case studies and will facilitate following skills:

- 1) Read, interpret, and analyze information from the textbook as well as external literature.
- 2) Use resources to find information beyond the assigned textbook and basic search engines.
- 3) Brainstorm and work in a group in a constructive manner.
- 4) Illustrate and present data and findings in front of the class.

Materials and Supply Fees

List if applicable

Relation to Program Outcomes (ABET):

The table below is an example. Please consult with your department's ABET coordinator when filling this out.

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

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

Required Textbooks and Software

- Title [Campbell Biology](#)
- Author [Lisa A. Urry, Michael L. Cain, Steven A. Wasserman, Peter V. Minorsky, Rebecca Orr](#)
- Publication date and edition: [2020 12th Edition](#)
- ISBN number: [9780135188743](#)

Comments: In addition to the textbook, the notes developed the instructor will be used to cover most topics.

Recommended Materials

- [There is no recommended material; however, the students are encouraged to search related course topics in the Internet. Also notes and materials from the class will help.](#)

Course Schedule

Wk	Begins	# Hours	Concepts*	Assignments Due
1	08/23	3	Syllabus, Introduction to biology	None
2	08/30	3	Biomolecules: Amino acids, peptides, proteins	None
3	09/06	2	Kinetics: Enzymes	HW 1, UF Homecoming
4	09/13	3	Biomolecules: Nucleic acids, lipids, carbohydrates	Quiz 1 (09/15)
5	09/20	3	Cells: structure and function	HW 2

6	09/27	3	Transport: Biological membranes	Career showcase
7	10/04	2	Communication: Cell signaling	None
8	10/11	3	Material and energy balances: Human physiology	HW 3, Quiz 2 (10/15)
9	10/18	3	Immune systems and engineering	None
10	10/25	3	Microbiology and engineering	None
11	11/01	3	DNA technologies and engineering	HW 4
12	11/08	3	Protein technologies and engineering	AIChE conference, Quiz 3 (11/12)
13	11/15	3	Cellular technologies and engineering	AIChE conference
14	11/22	1	Group discussions/catch-up	Group project (11/22)
15	11/29	3	Ecological and global systems	Extra credit (12/01)
16	12/06	2	Course and exam review	HW 5, Reading days (12/09-12/10)
17	12/13	0	Exam Week	Final Exam: 12/16 (12:30-2:30 PM)

*Some concepts may be covered by invited guest speakers.

Attendance Policy, Class Expectations, and Make-Up Policy

You are required to attend all lectures in-person or virtually, but it is on the honor system and I will not record attendance.

Cell phones, laptops and other electronics are allowed as educational devices only. Please do not distract others by using electronics for other purposes during class. There can be technical issues/challenges while conducting a HyFlex class, please be patient. If you are attending an in-person class and are live on zoom, please turn off your audio on zoom. Please do not multitask (check phones, texts, emails, etc.) while on zoom lectures. If you miss a class, try to watch the recorded videos as soon as possible.

Make-up policy

Make-up work will be considered on a case-by-case basis, commensurate with your circumstances in a manner that is fair to you and your classmates. There will be no make-up assignments for unexcused absences.

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
Homework Sets (5)	20 each	20%
Quizzes (3)	50 each	30%
Final Exam	150	30%
Group project	100	20%
		100%

Final Exam: 150 points

Final exam will be 150 points, with a total time limit of two hours. Exam questions are meant to assess your ability to understand and analyze problems. During the exam, you are permitted to use a calculator (any model without communication ability; you may not share), but are not permitted to refer to books or notes.

Note: Make-up exams will be considered on a case-by-case basis for documented, excused absences or emergencies. However, once you begin an exam, you may not be granted an excused absence for any reason.

Quizzes: 3 Total, 150 points; 50 Points Each

Each quiz will occur during lecture time, and will consist of a few multiple choice, true/false, or short answer questions, and totaling 50 points. During quizzes, you are not permitted to use a calculator (no complex calculations included), books, or notes.

Quiz questions will be easier (generally) and more conceptual than exam questions, and will assess your comprehension of lecture material and ensure that you keep up-to-date. Therefore, they may be announced or unannounced but you will be able to get a rough idea from the schedule as listed.

Team-Based Project: 100 Points

In the class project, you will work in groups of four-five to determine a challenge in biological systems process of your choice and propose a solution(s). You will prepare a short video presentation and upload it on zoom for everyone in class. Groups will be assigned, but you might get an option to choose one of your teammates. Topics will be claimed on a first-come, first-served basis, and no duplicate topics are allowed. A component of peer review will be incorporated.

More details will be given when the project is assigned in October.

Homework: 5 Total, 100 points; 20 points Each

Homework will be assigned approximately once per week, and will consist of 3-5 problems to submit. The submitted problems will be graded on the following basis:

Not attempted – 0% points

Attempted but not completed – 20% points

Completed but incorrect – 50% points

Completed and correct – 100% points

You should plan to spend at least 3 hours per week on homework (if not more). You are permitted to discuss the problems and problem-solving strategies with your colleagues, but you may not breach the Academic Honesty Course Policy (see below).

Homework is to be completed on the assignment document (see Canvas page) in neat handwriting (without excessive erasures or cross-outs) or typed in word on standard-size (8.5" x 11") paper, without frayed edges, folds or excessive wrinkling. Homework can be uploaded on Canvas using a scanner software or an app. You are responsible for making sure that the homework is uploaded on Canvas.

Homework is due at 5 PM on Mondays of the week. To incentivize you to finish homework assignments early, homework submissions by 5 PM on the Friday before the due date will receive **two automatic bonus points**. However, your total homework score may not exceed 100 points. You may also submit homework via e-mail any time prior to the due date, however, Canvas is preferred. **Late homework will not be accepted without prior documentation and approval.**

Extra Credit: 20 Points Possible

You will have the opportunity to earn a maximum of 20 extra-credit points. The deadline to turn in extra-credit is one week prior to the last lecture (i.e. you cannot submit extra credit after you see your final exam grade). More details will be provided in early November.

Grading Policy

Point Value	Percent Value (%)	Letter Grade*
470-500	94-100	A
460-469	92-93.9	Gray
445-459	89-91.9	A-
435-444	87-88.9	Gray
425-434	85-86.9	B+
420-424	84-84.9	Gray
405-419	81-83.9	B
395-404	79-80.9	Gray

Point Value	Percent Value (%)	Letter Grade*
380-394	76-78.9	B-
370-379	74-75.9	Gray
350-369	70-73.9	C+
335-349	67-69.9	Gray
310-334	62-66.9	C
300-309	60-61.9	Gray
275-299	55-59.9	C-
0-274	0-54.9	D/F (Gray)

*Depending on the performance of the class, grades may be curved uniformly at the discretion of the instructor.

More information on UF grading policy may be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

E-mail:

In order to ensure a timely response, put "ABE2062" (formatted exactly; all caps, no spaces) in the subject line. You must also use proper e-mail etiquette and professionalism.

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.bluer.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.

Online Course Recording

Our class sessions may be audio visually recorded for students in the class to refer back and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the "chat" feature, which allows students to type questions and comments live. The chat will not be recorded or shared. As in all courses, unauthorized recording and unauthorized sharing of recorded materials is prohibited.

University Honesty Policy

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 Conduct 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. 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 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
- Jennifer Nappo, Director of Human Resources, 352-392-0904, jpennacc@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/>.

COVID-19

- You are expected to wear approved face coverings at all times during class and within buildings even if you are vaccinated.
- If you are sick, stay home and self-quarantine. Please visit the UF Health Screen, Test & Protect website about next steps, retake the questionnaire and schedule your test for no sooner than 24 hours after your symptoms began. Please call your primary care provider if you are ill and need immediate care or the UF Student Health Care Center at 352-392-1161 (or email covid@shcc.ufl.edu) to be evaluated for testing and to receive further instructions about returning to campus.
- If you are withheld from campus by the Department of Health through Screen, Test & Protect, you are not permitted to use any on campus facilities. Students attempting to attend campus activities when withheld from campus will be referred to the Dean of Students Office.
- UF Health Screen, Test & Protect offers guidance when you are sick, have been exposed to someone who has tested positive or have tested positive yourself. Visit the [UF Health Screen, Test & Protect website](#) for more information.
- Please continue to follow healthy habits, including best practices like frequent hand washing. Following these practices is our responsibility as Gators.

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 Resource 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.

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: <http://www.distance.ufl.edu/student-complaint-process>.