

Biomedical Engineering Physiology

BME 5401 Section 11256

Class Periods: M, W, F; period 5; 11:45 AM – 12:35 PM

Location: Room 315 Black Hall

Academic Term: Fall 2024

Instructor: Prof. Jamal Lewis

Email: jlewis@bme.ufl.edu

Office Phone Number: (352)392-1598

Office Hours: Mondays, 4 – 5PM, 490 Wertheim Engineering Bldg.

Teaching Assistant/Peer Mentor/Supervised Teaching Student/ Learning Assistant:

Please contact through the Canvas website

- **Ms. Tran Ngo**, tranngo@ufl.edu, Office hours and location: TBD.

Course Description

Physiology of cells, bones, and the circulatory system from a biomaterials, biomechanics, cellular, and tissue engineering perspective. Intellectual property and technology transfer included (3 Credits).

Course Pre-Requisites / Co-Requisites

Upper level biology and enrollment in BME graduate program or permission of the instructor.

Course Objectives

1. To teach the student about physiological systems of the human body and their homeostatic control;
2. To teach the student to be able to discuss and answer questions about physiological systems of the human body;
3. To teach the student to apply knowledge learned about physiological systems of the human body to biomedical engineering research.

Materials and Supply Fees

N/A

Required Textbooks and Software

Title: Vander's Human Physiology, 15th Edition

Authors: Eric Widmaier, Hershel Raff and Kevin Strang

Published: 2019

Topics and Anticipated Sequence of Materials Covered in this Course

- Homeostasis (Chapter 1)
- Chemical Composition of the Body and Its Relation to Physiology (Chapter 2)
- Cellular Structure, Proteins, and Metabolic Pathways (Chapter 3)
- Movement of Solutes and Water Across Cell Membranes (Chapter 4)
- Cell Signaling in Physiology (Chapter 5)
- Neuronal Signaling and the Structure of the Nervous System (Chapter 6)
- Sensory Physiology (Chapter 7)
- Consciousness, the Brain, and Behavior (Chapter 8)
- Muscle (Chapter 9)
- Control of Body Movement (Chapter 10)
- The Endocrine System (Chapter 11)
- Cardiovascular Physiology (Chapter 12)
- Respiratory Physiology (Chapter 13)
- The Kidneys and Regulation of Water and Inorganic Ions (Chapter 14)
- The Digestion and Absorption of Food (Chapter 15)

- Regulation of Organic Metabolism and Energy Balance (Chapter 16)

Course Schedule

Canvas will be used to post the course schedule and quiz/exam dates. The schedule is tentative and subject to change based on course progress, the discretion of the instructor and student needs.

Attendance Policy, Class Expectations, and Make-Up Policy

Attendance: Attendance is not monitored but is essential for success in this course. It is your responsibility to keep up to date on the materials/assignments when you have missed class. Please notify me in advance if you will be missing (or have missed) more than 2 consecutive classes, as I am here to help if you experience illness or an event that makes it challenging to keep up with course material.

Communication: Class announcements will be posted to Canvas and all students are responsible for ensuring awareness of these postings. Failure to review the course website is not an excuse for missing assignments, class time changes, etc. All students are expected to communicate in a professional manner. Contact me via Canvas only, as this ensures a prompt reply (I have an email filter that flags the emails differently so they stand out from the hundreds of emails I receive each day).

Conduct: All students are expected to conduct themselves in a professional manner when participating in this course. A student participating in conduct that is not supportive of the educational experience will be requested to terminate this activity or leave the classroom. Discussions should be conducted in a respectful and courteous manner, to encourage a dynamic interaction from all in attendance.

Make-Up Policy: Make up exams and/or quizzes will only be permitted for university approved absences. Please review your student handbook to ensure that you understand the requirements for a university approved absence. Excused absences are consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

Assistance with Course Material: You should expect this course to challenge you and require time, effort, and thoughtful analysis for success. When a concept or problem presents a challenge, spend the time to really think about how to approach the problem, as this thoughtful analysis will train you for success in exams (and future classes). If you are struggling with a concept or problem, you have 3 primary resources: 1) your peers, 2) your STS and 3) your professor. Before you reach out to any of these resources, you are expected to have spent considerable time on your own attempting to understand or complete the problem.

Peers: Establishing a strong and fruitful peer network is an important resource in your major and will help serve you well as you progress in BME, so seek out colleagues that can serve as a strong peer network. Brainstorming on problems with your peer group (after you have attempted to solve them independently) is permitted; however, this dynamic interaction should be one that leads to improved conceptual understanding on how to approach problems – not one used as a crutch to copy solutions. Assignments are used to train you for exams, so copying solutions from friends will inevitably result in a poor exam performance. In the end, individual assignments must be your own work, not a copied solution. ***If copying of work on an individual assignment is evident, the problem will earn 0 credits.***

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	Percentage of Final Grade
Quizzes	40%
Exam I	20%

Exam II	20%
Exam III (Final)	20%
	100%

To maximize your partial credit in grading:

1. Write legibly and do not crowd your work.
2. Construct a clear diagram, if appropriate.
3. Write the equations you are using in symbols before substituting in numbers.
4. Label all numerical quantities/values with units.

Bonus Points: During the semester, bonus points can be earned during class periods via designated in- class assignments or discussions. Points are accrued between exam periods and are added to the final grade of each exam during that period. These points are offered to all students (never individually) and may be offered in-class only or off-line. **Opportunities vary throughout the semester and advanced notice will not be provided.**

Grading Policy

The following is given as an example only.

Percent	Grade	Grade Points
93.4 - 100	A	4.00
90.0 - 93.3	A-	3.67
86.7 - 89.9	B+	3.33
83.4 - 86.6	B	3.00
80.0 - 83.3	B-	2.67
76.7 - 79.9	C+	2.33
73.4 - 76.6	C	2.00
70.0 - 73.3	C-	1.67
66.7 - 69.9	D+	1.33
63.4 - 66.6	D	1.00
60.0 - 63.3	D-	0.67
0 - 59.9	E	0.00

Final cumulative numerical grades will be rounded to the nearest tenth of a point. Curving of assignments is exceptionally rare and typically only due to the entire class missing a question. No extra assignments for additional credit are given in this course. There is no curving of final grades.

Note: To graduate, students must have an overall GPA and an upper-division GPA of 2.0 or better (C or better). A grade of "C minus" is equivalent to a GPA of 1.67.

Grade challenges: We do our best to grade evenly and fairly, but mistakes in grading can happen. Requests to modify points on assignments, quiz, or exams must be submitted in writing to Dr. Lewis within 1 week from when the graded assignment was made available. The request should identify the question and provide clear justification/reasoning for the requested change. The instructor will then review the request and modify the grade, as necessary. For grade challenge requests, the instructor reserves the right to regrade the entire assignment, not just the points in question. The instructor also reserves the right to turn down unreasonable or frivolous grade challenge requests.

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.aa.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.aa.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

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](https://title-ix.ufl.edu), 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.

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>.