

## Biomedical Engineering and Physiology

BME 5401

**Class Periods:** MWF, period 3, ((9:50 to 10:25 AM)

**Location:** CHE0237

**Academic Term:** Fall 2019

### **Instructor:**

**Stephen Borst, Ph.D.**

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352-283-1567

### **Course Description**

Basic physiology of all major systems of the human body.

### **Course Pre-Requisites / Co-Requisites**

Upper level biology and enrollment in the BME 4+1 or BME graduate program or permission of the instructor.

### **Course Objectives**

- To teach the student about physiological systems of the human body and their homeostatic control
- To teach the student to be able to discuss and answer questions about physiological systems of the human body
- 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

### **Professional Component (ABET):**

State the contribution of the course to meeting the professional components of the ABET-accredited degree.

### **Relation to Program Outcomes (ABET):**

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

<b>Outcome</b>	<b>Coverage*</b>
1. An ability to understand the basic physiological mechanisms of the human body.	High
2. An ability to apply understanding of human physiology to disease states	Medium
3. An ability to formulate engineering questions related to human physiology	Medium
4. An ability to recognize the ongoing need for additional knowledge and locate, evaluate, integrate, and apply this knowledge appropriately.	Medium
5. An ability to function effectively on teams that establish goals, plan tasks, meet deadlines, and analyze risk and uncertainty	Medium

\*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

Vander's Human Physiology 15<sup>th</sup> Edition Authors: Eric Widmaier, Hershel Raff and Kevin Strang, ISBN number: 978-1259-90388-5

## Recommended Materials

### Course Schedule

Schedule:

Wed	8/21	Introduction 1. Homeostasis
Fri	8/23	1. Homeostasis
Mon	8/26	2. Chemical composition of the body
Wed	8/28	3a. cellular structure/proteins
Fri	8/30	3b. Cellular structure/proteins
Mon	9/2	Labor Day
Wed	9/4	3c. Cellular structure/proteins
Fri	9/6	Review
Mon	9/9	Exam 1
Wed	9/11	Exam answers
Fri	9/13	4. Movement across membranes
Mon	9/16	5. Cell signaling
Wed	9/18	6a. Nervous system
Fri	9/20	6b. Nervous system
Mon	9/23	6c. Nervous system
Wed	9/25	7. Sensory systems
Fri	9/27	8. Consciousness and behavior
Mon	9/30	Review
Wed	10/2	Exam 2
Fri	10/4	Homecoming
Mon	10/7	Exam answers
Wed	10/9	9a. Muscle
Fri	10/11	9b. Muscle
Mon	10/14	10. Control of movement
Wed	10/16	11a. Endocrine systems
Fri	10/18	11b. Endocrine systems
Mon	10/21	12a. Cardiovascular
Wed	10/23	12b. Cardiovascular
Fri	10/25	Review
Mon	10/28	Exam 3
Wed	10/30	Exam answers
Fri	11/1	13. Respiratory system
Mon	11/4	14a. Kidneys
Wed	11/6	14b. Kidneys
Fri	11/8	15. GI system
Mon	11/11	Veteran's Day
Wed	11/13	16. Fuel metabolism

Fri	11/15	Review
Mon	11/18	17. Reproduction
Wed	11/20	18. Immune system
Fri	11/22	review
Mon	11/25	Exam 4
Wed	11/27	Thanksgiving
Fri	11/29	Thanksgiving
Mon	12/2	Exam answers
Wed	12/4	Conclusions

### **Attendance Policy, Class Expectations, and Make-Up Policy**

State whether attendance is required and if so, how will it be monitored? What are the penalties for absence, tardiness, cell phone policy, laptop policy, etc. What are the arrangements for missed homework, missed quizzes, and missed exams? This statement is required: Excused absences must be consistent with university policies in the undergraduate catalog (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>) and require appropriate documentation.

### **Evaluation of Grades**

Assignment	Total Points	Percentage of Final Grade
Homework Sets (10)	100 each	15%
Quizzes (4)	100 each	15%
Midterm Exam	100	30%
Final Exam	100	30%
Review Paper	100	10%
		100%

### **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

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 requesting accommodations should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure 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/>.

### ***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/policies/student-honor-code-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 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](mailto:rbielling@eng.ufl.edu)
- Curtis Taylor, Associate Dean of Student Affairs, 352-392-2177, [taylor@eng.ufl.edu](mailto:taylor@eng.ufl.edu)
- Toshikazu Nishida, Associate Dean of Academic Affairs, 352-392-0943, [nishida@eng.ufl.edu](mailto: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](mailto: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:** <http://www.counseling.ufl.edu/cwc>, 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](mailto: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](mailto:Learning-support@ufl.edu).  
<https://lss.at.ufl.edu/help.shtml>.

**Career Resource Center**, Reitz Union, 392-1601. Career assistance and counseling. <https://www.crc.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://www.dso.ufl.edu/documents/UF\\_Complaints\\_policy.pdf](https://www.dso.ufl.edu/documents/UF_Complaints_policy.pdf).

**On-Line Students Complaints:** <http://www.distance.ufl.edu/student-complaint-process>.