Syllabus for Systems Physiology II
BME 2302
Fall 2022

Instructor:
Dr. Maizie (Xin) Zhou
Assistant Professor of Biomedical Engineering, Computer Science and Data Science Institute
Email: maizie.zhou@vanderbilt.edu
Stevenson Center 5919
In-person office hours: after class or by appointment.

Teaching Assistant:
Emily Berestesky (emily.d.berestesky@vanderbilt.edu)
In-person office hours: Fridays 10:00-11:00am, ESB 322 or by appointment.

Course Description:
Systems Physiology is an introduction to quantitative physiology from an engineering perspective. Systems Physiology II includes descriptive physiology of several organ and control systems (e.g., cardiovascular, respiratory, renal, digestive, reproductive, and immune) as well as engineering approaches to understanding normal function, pathological dysfunction, and strategies for restoration of function in each system. Mathematical modeling and computer simulation are used to illustrate important mechanisms of physiologic control.

Class time and location:
Tuesday and Thursday 1:15-2:30pm
Stevenson Center 5306

Text book:
Vander's Human Physiology: The Mechanisms of Body Function,
by EP Widmaier, H Raff, and KT Strang (16th edition)
CONNECT course registration: https://connect.mheducation.com/class/m-zhou-bme2302_fall2022

Grading:

Reading quizzes	10%
Live coding	5%
Homework	20%
Small projects	25%
Exams 1-3	10% each
Final exam	10%

Collaboration:
Students are encouraged to work in groups (of up to three people) on the small projects; each group can turn in a single report. Collaboration is also allowed on homework assignments, although each student should turn in a separate set of solutions, written in his/her own words. Students are not allowed to give or receive help on quizzes or exams (unless this is explicitly stated). This includes cases in which a student is absent on the day of an exam and takes it another day. Students must not discuss the content of exams with those who have yet to take the assessment.

Homework and MHConnect reading quizzes:
You are encouraged to work together on homework and in discussing reading assignments and material presented in class. Each person in the group should contribute an equal amount of effort to the assignment. Group members should work together to ensure that all persons share a similar understanding of the material. The work that you turn in, whether homework or an electronic assignment, must be your own and must reflect your own understanding of the material. Copying answers with or without the permission of the source or representing group work as your own is unacceptable.

Homework submission:
Homework assignments will be posted on Brightspace. Graded homework and exams will be returned on Brightspace. 3% penalty for each day late.

Participation bonus:
Students will receive bonus points by answering questions in class. Maximum bonus points account for extra 10%. Each question will account for 0.5%.

Examination Policy:
You are expected to take examinations at the scheduled time. If you have a valid scheduling conflict, please contact me at least two days in advance of the scheduled examination period in order to arrange an alternate examination time.

If you feel that you must reschedule due to illness, contact me in advance of the scheduled examination time. If you cannot reach me in person, please send a detailed e-mail message to me (maizie.zhou@vanderbilt.edu). If you do not contact me in advance, rescheduling will be permitted only under extenuating circumstances. Normally, the examination must be taken within two days of the scheduled time.

Finally, if you feel that an error was made in grading of homework assignments, exams or the final, submit a brief written argument within one week from the time the work was returned, explaining why you should get more points than you were given.

Honor code: You are bound by all provisions of the Honor Code, found in the Vanderbilt Student Handbook. Other pertinent material may be found at the Honor Council's website.

Disabilities: Vanderbilt is committed to equal opportunity for students with disabilities, as am I. If you need course accommodations due to a disability, please contact VU Student Access Services to initiate that process.

Grading Scale

≥ 93 to ≤ 100	≥ 90 to < 93	≥ 87 to < 90	≥ 83 to < 87	≥ 80 to < 83	≥ 77 to < 80	≥ 73 to < 77	≥ 70 to < 73	≥ 67 to < 70	≥ 63 to < 67	≥ 60 to < 63	≥ 0 to < 60
A	A−	B+	B	B−	C+	C	C−	D+	D	D−	F

Emergency Evacuation Plan:

In the event of a fire or other emergency, all occupants of our classroom should collect their personal belongings and leave the building through the exits closest to the lecture hall. The class should gather at the courtyard on the terrace between Stevenson, Featheringill Hall, and the NMR Center. VANDERBILT UNIVERSITY POLICY FORBIDS REENTRY TO A BUILDING IN WHICH AN ALARM HAS OCCURRED WITHOUT AUTHORIZATION BY VANDERBILT SECURITY. In case of a tornado warning, move to a designated area or other safe place inside the building, away from windows. Tornado warnings remain in effect for 30 minutes after the last issued warning.

Date	Day	Week	Class #	Topic	Reading	Assignment Due
Aug 25	Thurs	w0	0	Course introduction (HW #1 release)		
Aug 28	Sun					
Aug 30	Tues	w1	1	Principles of Programming with MATLAB		
Sep 01	Thurs		2	MATLAB Plotting – Numerical Solutions. Live Coding 1		Go over Live Coding 1 material prior to class
Sep 04	Sun					HW #1 due by midnight
Sep 06	Tues	w2	3	MATLAB Live coding 2		Go over Live Coding 2 material prior to class
Sep 08	Thurs		4	General principles of physiology: Homeostasis. Biological control systems	1.1-6	Ch.1 quiz #1 due 1pm
Sep 11	Sun					Livecoding due by midnight
Sep 13	Tues	w3	5	Cardiovascular system 1	12.1-4	Ch. 12 quiz #1 due 1pm
Sep 15	Thurs		6	Cardiovascular system 2 (HW #2 release)	12.5-13	Ch. 12 quiz #2 due 1pm
Sep 18	Sun					
Sep 20	Tues	w4	7	Cardiovascular system 3	12.14-27	Ch. 12 quiz #3 due 1pm
Sep 22	Thurs		8	Small Project 1 - heart		
Sep 25	Sun					
Sep 27	Tues	w5	9	Respiratory system 1	13.1-5	Ch.13 quiz #1 due 1pm
Sep 29	Thurs		10	Respiratory system 2	13.6-11	Ch.13 quiz #2 due 1pm
Oct 02	Sun					HW #2 due by midnight
Oct 04	Tues	w6	11	**Exam 1**		
Oct 06	Thurs		12	Renal system 1	14.1-7	Ch.14 quiz #1 due 1pm
Oct 09	Sun					Project 1 due by midnight
Oct 11	Tues	w7	13	Renal system 2 (HW #3 release)	14.8-20	Ch.14 quiz #2 due 1pm
Oct 13	Thurs					

Oct 16	Sun					
Oct 18	Tues	w8	14	Small Project 2 - kidney		
Oct 20	Thurs		15	Digestive system 1	15.1-5	Ch.15 quiz #1 due 1pm
Oct 23	Sun					
Oct 25	Tues	w9	16	Digestive system 2	15.6-8	Ch.15 quiz #2 due 1pm
Oct 27	Thurs		17	Metabolism	16.1-3	Ch.16 quiz #1 due 1pm
Oct 30	Sun					HW #3 due by midnight
Nov 01	Tues	w10	18	Temperature regulation	16.4-7	Ch.16 quiz #2 due 1pm
Nov 03	Thurs		19	**Exam 2**		
Nov 06	Sun					Project 2 due by midnight
Nov 08	Tues	w11	20	Reproductive physiology 1	17.1-11	Ch.17 quiz #1 due 1pm
Nov 10	Thurs		21	Reproductive physiology 2 (HW #4 release)	17.12-24	Ch.17 quiz #2 due 1pm
Nov 13	Sun					
Nov 15	Tues	w12	22	Immune system 1	18.1-3	Ch.18 quiz #1 due 1pm
Nov 17	Thurs		23	Immune system 2	18.4-6	Ch.18 quiz #2 due 1pm
Nov 20	Sun					HW #4 due by midnight
Nov 22	Tues					
Nov 24	Thurs					
Nov 27	Sun					
Nov 29	Tues	w13	24	Small Project 3 – paper review		
Dec 01	Thurs		25	**Exam 3**		
Dec 04	Sun					
Dec 06	Tues	w14	26	Course Summary		
Dec 08	Thurs		27			Project 3 due by midnight
Dec 13	Tues	w15		**Final Exam**		