## BIME 6004 Biology for Bioengineers

#### Fall 2023

## CLASS DAYS and TIME: Wednesdays and Fridays 3:00 to 4:30 PM

CLASSROOM: 4.444B (MED)

**COURSE FACULTY:** Susan Weintraub, Ph.D. (Course Director); Yidong Bai, Ph.D.; Lily Dong, Ph.D.; David Libich, Ph.D.; Philip Serwer, Ph.D.; Yuzuru Shiio, M.D., Ph.D.; Kexin Xu, Ph.D.; Weixing Zhao, Ph.D.

OFFICE LOCATION and HOURS: To be arranged with individual faculty

EMAIL: baiy@uthscsa.edu dongq@uthscsa.edu libich@uthscsa.edu serwer@uthscsa.edu shiio@uthscsa.edu weintraub@uthscsa.edu xuk3@uthscsa.edu zhaow2@uthscsa.edu

TELEPHONE: Contact faculty by e-mail

READ THIS DOCUMENT CAREFULLY - YOU ARE RESPONSIBLE FOR ITS CONTENTS.

#### **COURSE DESCRIPTION AND OBJECTIVES**

This course provides a broad background in biological concepts with specific attention given to biological processes important in bioengineering. Topics will include biochemistry, genetics, molecular biology, cell biology, and physiology. Applications will emphasize understanding cellular processes important in bioengineering, such as gene therapy and tissue repair and regeneration.

#### Pre-requisites -(none)

#### Semester credit hours – 3

By the end of this course, each student should be able to:

- Understand the basic concepts of biology and biochemistry
- Understand the basic concepts of methodology and technology used for biomedical research

#### **COURSE ORGANIZATION**

#### The main teaching modalities used in this course include:

- 1) Didactic lectures designed to covey information to the students in traditional lecture format
- 2) Student presentations about methodology and technology

**Materials** – There are no specific course materials required for this course.

**Computer Access** – Students will need access to a computer and the Internet to obtain course materials, take exams and for preparation of methodology/technology presentations.

Reading Assignments – Reading assignments will be posted prior to lectures.

## ATTENDANCE

Attendance is mandatory. Students are expected to attend all classes and to be on time. In cases of illness or other serious event, the student is responsible for all materials presented on that day. There will be no makeups for missed lectures or discussions. A student who misses an assigned presentation will receive no credit for that assignment.

## **TEXTBOOKS**

Required: (none)

**Strongly recommended:** *The Cell: A Molecular Approach*; eighth edition (Geoffrey M. Cooper), Sinauer Associates, 2019; ISBN: 9781605357713 (ebook)

## **GRADING POLICIES AND EXAMINATION PROCEDURES**

The course will have two equally-weighted, open-book exams and graded student presentations. The content and format of the exams will vary, depending on the instructor. In case of illness, a doctor's note will be required attesting to the seriousness of the illness. A make-up exam will be arranged when justified. Requirements for student presentations will be announced after the beginning of the semester, and will depend on the number of students enrolled.

## **Grading System**

A = 90-100% B = 80-89% C = 70-79% F = < 69%

## **REQUESTS FOR ACCOMMODATIONS FOR DISABILITIES**

In accordance with policy 4.2.3, Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA), any student requesting accommodation submits the appropriate request for accommodation under the American with Disabilities Act (ADA). Students submit **Student/Resident Request for Accommodation Under the Americans with Disabilities Act (ADA)**, form ADA-100, to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <u>http://uthscsa.edu/eeo/request.asp</u>.

#### ACADEMIC INTEGRITY AND PROFESSIONALISM

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at

http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/academicdishonestypolicy/

The values and ethics of the GSBS and UT Health San Antonio are based upon honesty, integrity, and mutual respect between all students, staff, and faculty. These values and ethics are applied to all endeavors that are related to activities performed by all members of the GSBS community. This includes any assignments, presentations, projects, and/or exams completed in this course. All students commit to not receiving or giving any aid on the completion of their work in this course including the use of Artificial Intelligence text generators such as ChatGPT. If you are unsure how this might pertain to this course, please contact the course director before submission of any assigned work.

## TITLE IX AT UTHSCSA

#### Title IX Defined:

Title IX of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads "no person in the United States shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance."

#### University of Texas Health Science Center San Antonio's Commitment:

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director.

In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567-2800. Additional information may be obtained at <u>http://students.uthscsa.edu/titleix/</u>

## EMAIL POLICY

All course communication will be conducted by e-mail using the student's institutional account. Students are expected to check their e-mail accounts regularly and are responsible for materials, assignments, notifications, and test materials distributed by e-mail.

## **USE OF RECORDING DEVICES**

The use of recording devices is allowed.

#### ELECTRONIC DEVICES

Cell phones may not be used in class and must be shut off during class. Computers or tablets can be used in class for class-related purposes and note taking. They may not be used for e-mail, web surfing, or any activity not related to class.

# **TENTATIVE CLASS SCHEDULE**

## BIME 6004

Biology for Bioengineers Fall 2023

Week	Date	Торіс	Instructor
1	8/30/23	Molecules and Membranes	Weintraub
	9/1/23	An Overview of Cells and Cell Research	Weintraub
2	9/6/23	Bioenergetics and Metabolism	Bai
	9/8/23	Genes and Genomes; The Nucleus	Xu
3	9/13/23	Epigenetics (lecture plus video)	Xu
	9/15/23	Replication, Maintenance, and Rearrangements of Genomic DNA	Zhao
4	9/20/23	RNA Synthesis and Processing	Zhao
	9/22/23	Protein Synthesis, Processing, and Regulation	Zhao
5	9/27/23	Protein Sorting and Transport: The Endoplasmic Reticulum, Golgi Apparatus, and Lysosomes	Libich
	9/29/23	Review	
6	10/4/23	Exam-1	_
	10/6/23	The Cytoskeleton and Cell Movement	Dong
7	10/11/23		Dong
	10/13/23		Shilo
8	10/18/23	Cell Renewal and Cell Death	Shiio
	10/20/23	Cancer	Shilo
9	10/25/23	Mitochondria, Chloroplasts, and Peroxisomes	Bai
	10/27/23		Weintraub
10	11/1/23	The Plasma Membrane	Serwer
	11/3/23	Cell Walls, the Extracellular Matrix, and Cell Interactions	Serwer
11	11/8/23	Open	
	11/10/23	Review	
12	11/15/23	Exam-2	
	11/17/23	Preparation for student presentations	
13	11/22/23	Thanksgiving	
	11/24/23	Thanksgiving	
14	11/29/23	Student presentations	
	12/1/23	Student presentations	
15	12/6/23	Student presentations	
	12/8/23	Student presentations	
16	12/13/23	Student presentations	
	12/15/23	Student presentations	