Physiological Regulatory Mechanisms (6304)
(CRN # 27899)
Course Syllabus, Spring 2021, Hybrid course
TTH: 9:00-10:20 pm
Location: Chemistry Computer Sci Bldg 1.0202
ONLINE(https://us.bbcollab.com/guest/2f79608f78bc4a1e975a383641e23c9b)

Instructor: Dr. Manuel Miranda
Office: Bioscience 2.166
e-mail: mmiranda3@utep.edu
Office Hours: Open door policy

Class time: This course will be delivered in a hybrid format. We will have live sessions at the scheduled time, the link is above this message. If you are not able to attend the on-site lecture due to COVID related symptoms, we will have remote connection via Blackboard collaborate.

TEXTBOOKS

1. Hille, B. Ion Channels of Excitable Membranes, 3th Ed. Sinauer Associates, Inc.
2. Gerald Karp. Cell and Molecular Biology: Concepts and Experiments. 4th Edition. Wiley

There will be presentations and discussion of scientific publications.

OBJECTIVES:
Upon completion of this class, students should be able to:

1. To study mammalian and bacterial cell functions and relate them to cell structure.
2. To gain an understanding on the basic mechanism of cell signaling and molecular complex formation.
3. To gain critical thinking and integrative skills required for cell physiology research.

IMPORTANT DATES
First day of classes: January 19th, 2021
Census Day: February 3rd
Course Drop Deadline: April 1st
Last day of classes: May 6th
Final Exam: May 10th, 10:00 am

EXAMINATION PROCEDURE

- There will be two exams during the semester.
- There will be a comprehensive Final Examination of all the information that we have covered in the class during the semester.
- In addition to the above, there will be several student presentations

GRADING POLICY

A = 90-100
B = 80-89
C = 70-79
D = 60-69
F = Below 60

GRADE DISTRIBUTION

Exams (2)	40%
Final Exam	10%
Student presentation	50%

This syllabus is tentative and may be changed during the semester

LECTURE	DATE	TOPIC	Required Reading
		Overview and review of basic cell structure function and cell diversity in mammals	
		Review - The cell membrane	Paper discussion
		The plasma membrane and internal membranes	Paper discussion
		Transport across biological membranes: NaK-ATPase, gastric H-ATPase	Paper discussion
		The membrane potential	Paper discussion
		The Ca^{++}-ATPase, H-ATPase and other membrane ATPases	Paper discussion
		Oxidative phosphorylation in the mitochondria and E. coli plasma membrane	Paper discussion
		The rotatory F_1F_0- ATP synthase and the Vacuolar V-ATPase	Paper discussion
		Electrophysiology of Excitation & Conduction Ionic Basis of Excitation	Paper discussion
		Families of plasma membrane receptors	Paper discussion and handout
		Electrophysiology of Excitation & Conduction Ionic Basis of Excitation	Paper discussion
		Growth Factors and Neurotrophins. Domains and adaptor proteins	Paper discussion
		Cell-to-cell signaling: hormones, receptors and intracellular messengers	Paper discussion
		Structure and Function of Kinases	Paper discussion
		Structure and Function of Phosphatases	Paper discussion

		Role of PP1, PP2 and calcineurin in cell function	Paper discussion
		G proteins and ras signaling	Paper discussion
		MAP Kinases and signaling	Paper discussion
		FIVE and PHD domains	Paper discussion
		SH2 and SH3 domains	Paper discussion
		Synaptic scaffold	Paper discussion
		PDZ domain	Paper discussion
	Dec 10th	Final Exam	