Syllabus, Molecular Basis of Human Disease, BIMM 110, winter 2019

Location: TATA Hall 3201

Time: 9:30AM to 10:50AM, Tuesday and Thursday

Instructor: Professor Dong-Er Zhang, email: dez@ucsd.edu

Website for the course: TED with your own username and password

Course Description:

This course presents 1) genetic, biochemical, and molecular biological approaches used to identify the molecular basis of human diseases; 2) the current understanding of selected major human diseases at molecular and cellular levels with resulted physiological consequences; 3) successful and possible therapeutic treatment of these human diseases. This is an upper level undergraduate class. It is expected that students who take BIMM 110 already have a good background in molecular biology, metabolic biochemistry, and genetics.

There is no required course textbook. L*ecture slides will be posted on the TED website and are available for download.*

Week 1:

January 8, Lecture 1: Diseases, genes, cell cycles, and chromosomes

January 10, Lecture 2: Human disease pedigree and hemophilia

Week 2:

January 15, Lecture 3: Gene expression, mutation, and diseases of red blood cells

January 17, Lecture 4: Identification of disease genes by analyzing human genome

Week 3:

January 22, Lecture 5: Epigenetics in gene expression, human diseases, and X-inactivation

January 24, Lecture 6: Cell lines and animal models to study human diseases

Week 4:

January 29, Lecture 7: Meiotic disjunction and chromosomal numerical abnormalities

January 31, Lecture 8: Muscle disorders

Week 5:

February 5, Lecture 9: Human Mitochondrial Diseases

February 7, Review before midterm exam

Week 6:

February 12, Midterm exam

February 14, Lecture 10: Stem cells and related therapy

Week 7:

February 19, Lecture 11: Molecular basis of human skin diseases (Guest Lecture, George Sen, PhD)

February 21, Lecture 12: Cancer and oncogenes (Danielle Garshott)

Week 8:

February 26, Lecture 13: Tumor suppressors and immunotherapies

February 28, Lecture 14: Genetic Characteristics of Ophthalmologic Diseases and Treatment (Guest Lecture, Kang Zhang, MD-PhD)

Week 9:

March 5, Lecture 15: Neurodegenerative diseases, multiple sclerosis and Parkinson Disease

March 7, Lecture 16: Neurodegenerative diseases, dementia and Alzheimer Disease (guest lecture, Gwen Kaeser, PhD)

Week 10:

March 12, Lecture 17: Cystic Fibrosis

March 14, Review before final exam

Class attendance: Students are expected to attend all lectures. Keep cell phone off or on vibrate mode.

Course grading

MIDTERM EXAM: February 12, 9:30 - 10:50 AM, in our regular classroom. The midterm exam will account for 30% of the final grade. No make-up exams.

FINAL EXAM: March 19, 8:00 - 10:59 AM, location will be announced later. The final **comprehensive** exam (all lectures) will account for 61% of the final grade. No Make-up exams.

Both exams will be closed book/closed computer/no any electronics. There will be zero tolerance to any cheating behavior. The format of midterm and final exams will be similar, i.e. short answers to short questions. All questions on both exams will be derived from lecture materials.

The midterm and final exam questions with answers from last year will be at the TED website to assist you to prepare for the exams.

Students will get one point by attending your registered discussion session each week.

Overall course letter grades will be calculated: midterm x 30% + final x 61% + 9% discussion sessions (times of attending weekly sessions) = score

90-100 - A

78-89 - B

65-77 - C

53-64 - D

0-52 - F

Regrades: We will randomly copy students' exams. Only exams written in ink can be submitted for regrade. Any requests for regrades must be submitted in writing (clearly state the reason for regrade request and attach the statement to the complete exam) within 7 days after the exams have been returned for the midterm (the deadline of final exam regrade will be announced later). Professor Zhang reserves the right to regrade the entire exam when a request is submitted, which may change the score in either directions.