Scholars BIO 315

Instructor
Dr. Rebecca Kellum
Office: THM 319
Phone: 257-9741/e-mail: rkellum@uky.edu
Lecture: in THM 116, T and R, 2:00-3:15 pm
Lab: in THM B03, Section 001: M 9:00-11:50 am
Section 002: M 1:00-3:50 pm
Office Hours: anytime by appointment rkellum@uky.edu

Lab TA: TBA

Course Objectives
The structure and function of the cells will be considered. Emphasis will be placed on the ultrastructure of cell organelles and the molecules that compose them as a framework for understanding the mechanisms of cell activity. Weekly hands-on laboratory exercises will reinforce concepts and experimental methods covered in lecture. Emphasis will be placed on primary literature articles related to the course material.

Required Text
Essential Cell Biology, 4th edition (2014) Alberts, et al. Garland Science

Canvas
Old exams, Echo recordings of lectures, lab exercises, primary literature articles for discussions, on-line homework assignments, and all course grades and will be available on Canvas. Answers to old exams and homework assignments will not be posted until the week before the relevant exam, but begin working through them as material is covered. Answers to in-class exams will be posted after they are graded and handed back to the class.

Grading
Course grades will be determined from a combination of grades from the Lecture (70%), Lab (15%), and Discussion (15%) portions of the course. The Lecture grade will be determined from three Lecture Exams (each exam worth 25% Lecture grade) and ten on-line Homework Assignments available on Canvas (HW average worth 25% Lecture Grade). The Lab grade will be determined from three Lab Exams (average worth 50% Lab grade) and four Lab Reports (average worth 50% Lab grade). There will be six discussion periods devoted to primary literature articles. Students should be prepared to answer questions and interpret data from these articles during the discussion periods, and questions about the articles will be included on both lecture and lab exams. There will also be three written homework assignments related to the discussion articles. Exams will contain a mixture (50/50) of multiple choice and essay questions.

Students who miss any assignment (exam, homework, or lab report) without an official excuse (serious illness of student, illness or death of family member, university related trips, religious holiday) will be given a zero for that assignment. Students with an official

excuse for missing a lecture assignment should contact me (rkellum@uky.edu) ***within a week*** of the missed assignment to schedule a make-up exam. Those knowing in advance that they will miss an exam should schedule to take the regular exam in advance. Students should similarly contact the TA for their lab about absences from lab.

Class Attendance
Class attendance will be taken on discussion days and in the lab. BUT be forewarned that I am less inclined to write a positive recommendation letter for a student who has not taken advantage of all the course has to offer, including participation in in-class lectures. ECHO recordings are not intended as a substitute for attending lectures. They are available for students who have an official excuse for missing them and for students who wish to review specific lecture content. I am unfortunately unable to record the discussions that take place during the lab period, as the equipment needed for doing so is not available in that room.

Cheating and Plagiarism
Cheating and plagiarism are academic offenses that are not tolerated at the University of Kentucky. The minimum penalty for either offense as a first offense is an automatic grade of zero on the assignment and possible E grade in the course. Suspension and dismissal may result from repeated or more serious offenses.

Disabilities
Students requiring accommodations for disabilities are to contact me ***during the first week of class*** to establish the procedure for taking exams throughout the course.

Lecture and Lab Schedule

Date	Chapter	Topic
Jan. 14	Chapter 1	Cells: Microscopy (panel 1-1)
Jan. 18	MLK Day	
Jan. 19	Chapter 3	Energy, Catalysis, and Biosynthesis
Jan. 21	Chapter 4	Protein Structure and Function
Jan. 24 (Sun)	Homework 1 due (Ch 1-4)	
Jan. 25	*Lab 1A*	*Microscopy I (Standard Light Microscope)*
Jan. 26	Article #1: X ray crystallography of prion proteins	
Jan. 28	Chapter 11	Membrane Structure
Jan. 31	Questions on Article #1 due	
Feb. 1	*Lab 1B*	*Microscopy II (Fluorescence Microscopy)*
Feb. 2	Chapter 12	Transport Across Cell Membranes

Feb. 4	Chapter 12	
Feb. 7 (Sun)	Homework 2 (Ch 4, 11, 12)	
Feb. 8	*Discussion of Labs 1A and 1B, Article #2: Super resolution microscopy*	
Feb. 9	Chapter 13	How Cells Obtain Energy from Food
Feb. 11	Chapter 14	Energy Generation in Mitochondria and Chloroplasts
Feb. 14	Questions on Article #2 due	
Feb. 15	*Lab 2A/B*	*Subcellular Fractionation & SDH Enzyme Kinetic Assays*
Feb. 16	Chapter 14	
Feb. 18	Article #3: Mitochondrial dysfunction and neurodegeneration	
Feb. 21 (Sun)	Homework 3 (Ch 13, 14) AND Questions on Article #3 due	
Feb.22	*Lab 2A/2B Discussion*	
Feb. 23	Lecture Exam I (Ch1-4 & 11-14, Articles #1 & 3)	
Feb. 25	Chapter 15	Intracellular Compartments and Protein Transport
Feb.29	*Lab Exam I (Labs 1 and 2, Article #2)*	
Mar. 1	Chapter 15	
Mar. 3	Chapter 17	Cytoskeleton
Mar. 6 (Sun)	Homework 4 (Ch 15, 17)	
Mar. 7	*Lab 3A*	*Actin/Myosin from Chicken Muscle, with Bioinformatics*
Mar. 8	Chapter 17	
Mar. 10	Article #4: Tauopathy Disease	
Mar. 14-19	Spring Break	
Mar. 20	Questions on Article #4 due	
Mar. 21	*Lab 3B*	*Electrophoresis of Chicken Muscle Protein Fractions*
Mar. 22	Chapter 5	DNA and Chromosomes
Mar. 24	Chapter 6	DNA Replication, Repair, and Recombination
Mar. 27 (Sun)	Homework 5 (Ch 17, 5)	
Mar. 28	*Lab 3C*	*Analyses of Mutant Protein & DNA (+ Blotting Exercises)*
Mar. 29	Chapter 7	From DNA to Protein: How Cells Read the Genome
Mar. 31	Chapter 7	
Apr. 3 (Sun)	Homework 6 (Ch 6, 7)	
Apr. 4	*Discussion of Labs 3A, B, and C, Article #5: PRC in ES cells*	

Apr. 5	Chapter 8	Control of Gene Expression
Apr. 6 (**Wed**)	Homework 7 (Ch 7, 8)	
Apr. 7	Lecture Exam II (Ch 15, 17, 5-8 + Article #4)	
Apr. 10	Questions on Aticle #5 due	
Apr. 11	*Lab Exam II*	*(Labs 3A, B, and C + Article #5)*
Apr. 12	Chapter 18	The Cell Division Cycle
Apr. 14	Chapter 18	
Apr. 17 (Sun)	Homework 8 (Ch 18)	
Apr. 18	*Lab 4A*	*Chromosome Squashes,Article #6-Stem cells, aging, cancer*
Apr. 19	Chapter 16	Cell Signaling
Apr. 21	Chapter 16	
Apr. 24 (Sun)	Homework 9 (Ch 16) AND Questions on Article #6 due	
Apr. 25	*Lab 4B*	*Visualization of Insulin Signaling & Discussion*
Apr. 26	Chapter 20	Cell Communities: Tissues, Stem Cells, and Cancer
Apr. 28	Chapter 20	
May 1 (Sun)	Homework 10 (Ch 20)	

Final Exam Week Schedule

May 3 (1:00 pm)	Lecture Exam III
May 3 (10:30 am)	Lab Exam III (Section 001) (may be taken at section 002 time)
May 4 (8:00 am)	Lab Exam III (Section 002)