Biol 4714 Cell Biology Fall 2021

Course Information and Syllabus

Instructors: Scales & Rincon-Zachary **Office: BO 218**
Email: jon.scales@msutexas.edu **Office Hrs: By Appointment**
Lecture: 9:00-9:50 MWF Room: 209 **Lab: 2:00-4:50 W Room: 205**

Course Philosophy:

We will emphasize several aspects of Cell Biology including: organelle structure & function, cellular metabolism, intracellular trafficking, cell signaling, and cell adhesion. In the lab component we will explore experimental methodologies that make the study of these areas possible.

Aspects of Cell Biology underlie virtually every subdiscipline of Biology. The topics in the course are very integrated and the need for a strong foundation in the basic principles of chemistry and biology can't be stressed enough. We will build on information you have already encountered in PoB/Life I, Gen Chem, O Chem, Biochem & Genetics. If you lack the necessary prerequisites, you will need to work diligently to keep up in this course.

You can only get out of any course what you put into it; therefore, I expect student participation in my courses by way of asking and answering questions during lectures. Obviously, attendance is a must for this to happen and excessive absences are grounds for being dropped.

Course Materials:

Textbook: Cell Biology by T Pollard & W Earnshaw; 3rd Ed
D2L: Worksheet assignments, when given, will be disseminated via D2L. Lecture powerpoints are also available.

Course Work:

Reading:

It is expected that you will read the listed readings from the textbook. One good method of doing this is to scan through the chapter before coming to class and then more thoroughly read the material we cover afterwards. The logic of this approach is that you will have seen new terms we bring up in class in the overall context of the topic and then you can go back for more detail after we discuss it in class. Sometimes, we will spend several lectures on a single chapter, at other time, we may cover 2 or more chapters per lecture. Most of the chapters are very short (for a textbook) and are focused on a single aspect of a broader topic.

Quizzes:

There could be quizzes in either lecture or lab periods. As best as possible, quizzes will be announced in advance, but fortune favors the prepared mind: always be prepared for a quiz!

Examinations:

We will have three exams (including the final) at approximately 5 week intervals. Since the subject matter of Cell Biology builds on itself (i.e. the stuff we learn at the beginning is used during the latter part of the course), all the exams have a somewhat comprehensive quality to them when it comes to general concepts.

Make-Up Exam Policy:

There will be no make up exams, make up labs, or make up quizzes.

Laboratory:

The lab portion of the course will be 25% of your total grade. Following each lab exercise/activity, a write-up will be turned in the next week or in the case of multiple week exercises, after the last week of that particular exercise. See the attached pages for the format to use for the lab write-ups.

Rules & Regulations:

Students should refer to the current MSU handbook and activities calendar for university policy on academic dishonesty, class attendance, student rights and activities.

Electronic note-taking tablets may be used to hand write notes, but no laptops, tablets, or other such devices may be used for typing notes or watching slides during lectures. Cellular device usage during lectures is prohibited. Audio recording of lectures is permitted with prior permission from the instructor. Audio recording may not be done on a cellular device, but only with a device solely for audio recording. No video or photographic recording during lecture is permitted. Students violating any of these restrictions may be dropped from the course.

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Students that have been certified through the office of Disability Services with disability accommodations must provide documentation from that office in a timely fashion; at a minimum 2 weeks prior to any examination.

Grading and Point Assignment:

A ≥ 90 B ≥ 80 C ≥ 70 D ≥ 60 F < 60

3 Exams @ 25% each --------	75%
Lab & Lecture Quizzes --------	5%
Lab Exercises/Write-Ups --------	25%

Tentative Lecture & Lab Schedule

Week	Lecture Topic	Reading	Lab Topic
1	Course Introduction - General Principles	1-2	No Lab
	Basic Cellular Concepts	1-2	
2	Molecular Structures	3-5	Introduction to Cell Fractionation – Plasmid Transformation
	Membrane Structure & Compartments	13 - 17	
3	Mitochondria & Respiration	19	Plasmid Prep
	Chloroplasts & Photosynthesis	19	
4	Nuclear Structure & Function	7-9	Differential Centrifugation & Cell Fractionation
5	**Exam I Sept 20**		Analysis of Cellular Fractions
	Gene Expression	10-11	
6	Protein Synthesis & Folding	12	Analysis of Cellular Fractions
	Protein Targeting & Transport	18	
7	ER & Golgi processes	20-21	Protein Expression & Analysis
8	Endocytosis & protein degradation	22-23	Western Blotting
	Signaling Pathways & Components	24-25	
9	Second Messengers	26	Altering Gene Expression I GA Treatment
	Signal Integration	27	
10	**Exam II Oct 25**		Altering Gene Expression II Independent Exp
	Cytoskeleton	33-35	
11	Motor Proteins & intracellular transport	36-37	Altering Gene Expression III RNA isolation
	Cell Motility	38	
12	Extracellular Matrix	28-29	Altering Gene Expression IV RT PCR
	Cellular Adhesion	30	
13	Intercellular Junctions	31	
	Cell Cycle	40	
14	Regulation of Proliferation & DNA replication	41-43	Thanksgiving
	THANKSGIVING		
15	Mitosis & Meiosis	44-45	Graduate Presentations
	Apoptosis	46	
	Final Exam Dec 6, 8-10 AM		

Graduate Credit

Students enrolled to receive graduate credit will complete the following requirements in addition to those already set forth above.

Students will answer additional exam questions targeted to a graduate understanding of the material.

Students will give a presentation during a lab period covering a paper or papers dealing with an appropriate cell biological topic. Papers/topics will be approved in advance by the instructor. This presentation will be given in the last lab meeting period of the semester.