

Course Description

This course explores the molecular basis of cell structure, organization, and function. Topics include bioenergetics and enzymes, genetic mechanisms (recombination, nuclear organization), internal cellular organization and activity (the cytoskeleton, membrane structure/function, cytoplasmic organelles, sorting to intracellular compartments, vesicular trafficking, and intracellular communication), cell growth and reproduction (the cell cycle and cell division), and cells in the context of the organism (cell junctions and adhesion, extracellular matrix, cell motility, and cell-cell signaling). An emphasis will be placed on experimental methods and strategies applied to molecular and cell biological investigations. Text and lecture materials will be supplemented with readings from the current literature. We are also using an online learning tool, WileyPlus, for which you will need to purchase for access.

Class time will be a combination of lecture and team activities (who wants to listen to a lecture for 3 hours?) that allow you to apply the concepts you learn in the class to “real” cell biological problems. In addition, you will work as a team in the review sessions that will be held on Thursdays in preparation for the Exam on Tuesday.

Course Objectives

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

- link the structures of key cellular components (including membranes, organelles, the cytoskeleton, and the genetic material) to their specific cellular functions, explain how these functions are regulated at the molecular level, and describe how such components work as systems to carry out processes such as cell division, intracellular transport, signaling, and communication with other cells and external agents
- ask the sorts of questions that generate testable hypotheses, design experiments that rigorously test those hypotheses, and interpret experimental findings.
- describe the many types of cell and molecular biological techniques currently in use, and explain how to apply them to answer specific cell and molecular processes
- convey their ideas effectively to others, and to work with and learn from others as they strive toward achieving a common goal

Instructors

Dr. Carolyn Norris, email crn@jhu.edu

Dr. Cynthia Wagner, email cwagner@umbc.edu, BS 456

Required Textbook

Cell and Molecular Biology: Concepts and Experiments; Gerald Karp, 7th ed. (6th ed is OK, but need to purchase WILEYPLUS
WileyPLUS online learning resource

Grading Policy

Individual Performance

Unit Exams X 3 (15% each)	45%
Comprehensive Final	25%
WileyPLUS X 15 (1% each)	15%

Team Performance

Team MC Review Questions X 5 (2%) each	10%
Team Peer Evaluation	5%

Explanations of grades

Unit Exams

There will be four Unit Exams and you will be able to drop the lowest one. Exams will be on Tuesday mornings from 9:30-10:45. We will start the next unit at 11:00 that day. There will be NO makeup exams given. Each Exam will contribute 15% of your final grade.

Comprehensive Final

The final will be comprehensive and contribute 25% of your final grade.

WileyPLUS

This is the online learning resource we are using and it is linked to BB. There will be 17 of these assignments; the first one is not graded and you will be able to drop your two lowest scores. The assignments will be due at 9 am and will relate to the topics covered in the previous day's class. For example, on July 9th, there is a homework set relating to Chapters 1 and 2 due on July 10th at 9 am. This will contribute to 15% of your final grade.

Team MC Review Questions

You will be assigned to a team for the summer session. Every Thursday (and on Wednesday, August 14th) we will have a review with multiple-choice questions that you will answer as a team. You will not get credit for these if you do not attend class.

Team Peer Evaluation

You will rate your team mates for their contributions to the team using a rubric provided to you. This peer evaluation will contribute 5% to your final grade.

Course Schedule

DATE	READING	TOPIC	
July 9	Chapter 1, 2, 18.1-18.8 and 18.18	Intro, chemistry of life, studying cells	cw/crn
July 10	Chapter 3: 3.1 Chapter 4: 4.1-4.6	Bioenergetics, Membrane structure/function	cw
July 11	Chapter 4: 4.7, 4.8	Membranes, con't/Membrane transport/exam 1 review	cw/crn
July 16	EXAM 1/chapter 8.1	endomembrane	crn
July 17	Chapter 8: 8.2-8.5	endomembrane	crn
July 18	Chapter 8: 8.6-8.9	Endomembrane/exam 2 review	crn
July 23	EXAM 2/ Chapter 9: 9.1, 9.2	cytoskeleton	cw
July 24	Chapter 9: 9.3-9.5, 9.7	cytoskeleton	cw
July 25	Chapter 7	ECM/exam 3 review	cw
July 30	EXAM 3/ Chapter 14: 14.1	Cell cycle	cw
July 31	Chapter 14: 14.2	mitosis	cw
August 1	Chapter 15: 15.8	Cell death/exam 4 review	crn
August 6	EXAM 4/Chapter 15: 15.1, 15.2	Signal transduction	crn
August 7	Chapter 15: 15.3	Signal transduction	crn
August 8	Chapter 15: 15.4-15.7	Signal transduction	crn
August 13	Chapter 16	cancer	cw
August 14		Final review	crn/cw
August 15	COMPREHENSIVE FINAL		