

CELL BIOLOGY

Course ID: SCB255
Course Title: Cell Biology
Department: Natural Sciences
Discipline: SCB-Biology
Course Credits: 4 credits 6 hours (3 lecture, 3 laboratory)
Course Coordinator: Dr. Thomas M. Onorato (thomas.onorato@gmail.com)

Required Textbook: Essential Cell Biology, 4th Edition, Bruce Alberts *et al.*, 2013
(ISBN 978-0-8153-4525-1), Publisher: Garland Science

Course Description: This is a one-semester laboratory-based course stressing essential aspects of cell biology. Cell structure and function will be introduced. Topics to be covered include, but are not limited to, membrane transport, protein sorting, vesicular trafficking, cytoskeletal components, how cells read the genome, signal transduction, cancer, apoptosis, and stem cells. Students will conduct authentic undergraduate research projects involving cell culture.

Prerequisite: SCB252, ENG102, SCB202, SCC202

Grading:	Midterm & Final exams (15% ea)	30%
	4 assignments @ 5% each	20%
	Research manuscript	20%
	Research project design	10%
	ePortfolio	10%
	1 Literature presentation	<u>10%</u>
		100%

ARTIFACT ASSESSMENT

This class will be depositing student work for this semester. Students will be depositing assignments for:

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|--------------------------------|----------------------------|
| 1) Inquiry and Problem Solving | Written ability |
| 2) Global Learning competency | Oral Communication ability |
| 3) Integrative Learning | Digital ability |

For a tutorial on how to deposit student work, go to: <http://eportfolio.lagcc.cuny.edu/support/tutorials.htm> and find the section called, "Assessment for Students." Click on the adobe flash button for "Depositing Assessment Artifact in Digication Instructions for Students." You will see a brief video on how to deposit.

PERFORMANCE OBJECTIVES:

1. Interpret the concepts of basic cell structure and function.
2. Describe the transcriptional, post-transcriptional and post-translational control of gene expression.
3. Explain complex intracellular functions, such as protein sorting and membrane trafficking.
4. Illustrate various signal transduction mechanisms.
5. Identify the components of the cytoskeleton, cell junctions and the extracellular matrix.
6. Define the stages of and the regulatory components of the cell division cycle.
7. Explain the cellular mechanisms involved in cancer and apoptosis.
8. Describe the cell biology of stem cells and the concept of cellular differentiation.
9. Perform techniques used to study cell biology and to visualize cells.
10. Conduct authentic undergraduate research.
11. Illustrate critical thinking, written, and oral communication skills through written assignments and oral presentations.

LECTURE OUTLINE	LABORATORY OUTLINE
<p>Week 1 Introduction to cells; Origin of cellular life (ibiology.org)</p> <p>Week 2 Chemical components; Protein structure and function; Organization of cytoplasm (ibiology.org); Assignment 1</p> <p>Week 3 DNA and chromosomes; How cells read the genome; Control of gene expression</p> <p>Week 4 Cellular membrane structure and transport; protocell membranes (ibiology.org), Assignment 2</p> <p>Week 5 Intracellular vesicular trafficking; Protein sorting; mysterious membranes (ibiology.org)</p> <p>Week 6 Cytoskeleton Midterm exam</p> <p>Week 7 Cell junctions and extracellular matrix</p> <p>Week 8 Cell signaling, Assignment 3</p> <p>Week 9 Cell division cycle and gametogenesis</p> <p>Week 10 Cancer; Cell death; Assignment 4</p> <p>Week 11 Stem cells; Cell differentiation</p> <p>Week 12 Pathogens and infection</p> <p>Week 13 Final Exam</p>	<p>Week 1 Lab safety; Manipulating proteins, DNA, RNA; Research project introduction.</p> <p>Week 2 Visualizing cells; Research project experimental design.</p> <p>Week 3 Cell culture; Research project experimental design presentation and peer review.</p> <p>Week 4 Begin Research project; Introduction outline due.</p> <p>Week 5 Research project continued; Literature presentation.</p> <p>Week 6 Research project continued; Literature presentation.</p> <p>Week 7 Research project continued; Literature presentation; Introduction and materials and methods draft due.</p> <p>Week 8 Research project continued; Literature presentation; Introduction and materials and methods draft peer review.</p> <p>Week 9 Research project continued; Literature presentation; Introduction and materials and methods draft peer review.</p> <p>Week 10 Research project continued; Literature presentation; Results and discussion draft due.</p> <p>Week 11 Research project continued; Literature presentation; Results and discussion peer review.</p> <p>Week 12 Finish research project data collection; Literature Presentation.</p> <p>Week 13 Final revised complete manuscript due.</p>