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**BOROUGH OF MANHATTAN COMMUNITY COLLEGE**

The City University of New York

Department of Science

**General Biology Lecture - BIO 108**

**Lecture hours: 3**

**Spring 2019**

**Credits : 3**

**Instructor Information (Phone \_\_\_\_\_, Office N\_\_\_\_, email \_\_\_\_\_@[bmcc.cuny.edu](mailto:bmcc.cuny.edu)**

**Office hours:**

**SCIENTIFIC WORLD BUCKET**

**Course Description**

General Biology presents an overview of many important topics in the natural sciences today and provides relevant background material from the physical sciences. It traces life from its beginning (cells) to the development of multi-cellular organisms. It traces life from its beginning (cells) to the development of multi-cellular organisms. It covers topics such as evolution, macromolecules, the cell (structure and function), energy relationships (photosynthesis and respiration), cellular activities (mitosis, meiosis, DNA replication and gene expression), inheritance, molecular genetics, and body systems.

**Basic Skills:** MATH 051 ENG 088 ACR 094

**Prerequisites/ Co-requisites:** BIO 109 (laboratory course that accompanies BIO 108). Students are required to take both BIO 108 and BIO 109.

| <b>Course Student Learning Outcomes</b>  | <b>Measurements</b>  |
|--|--|
| <b>1.</b> Students will understand basic principles of biology including life from its beginning (cells) to the development of multi-cellular organisms, evolution, macromolecules the cell (structure and function), energy relationships (photosynthesis and respiration), cellular activities (mitosis, meiosis, DNA replication and gene expression), inheritance, molecular genetics, and body systems. | <b>1.</b> Graded homework assignments. Quizzes/examinations.                   |
| <b>2.</b> Students will be able to understand the structure, functions and activities of different kinds of cells.   | <b>3.</b> Graded homework assignments. Quizzes/examinations.                   |
| <b>3.</b> Students will be able to understand the basis and mechanisms of inheritance.   | <b>4.</b> Graded mitosis, meiosis and genetics problems; Quizzes/examinations. |

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**Below are the college's general education learning outcomes, the outcomes that are checked in the left-hand column indicate goals that will be covered and assessed in this course. (Check at least one.)**

|   | <b>General Education Learning Outcomes</b>  | <b>Measurements (means of assessment for general education goals listed in first column)</b>        |
|---|---|---|
| X | <b>Communication Skills-</b> Students will be able to write, read, listen and speak critically and effectively. |   |
| X | <b>Scientific Reasoning-</b> Students will be able to apply the concepts and methods of the natural sciences.   | Students will conduct hypothesis- driven laboratory experiments and report and analyze the results. |

### Pathways Learning Outcomes

| <b>Student Learning Outcomes</b>  | <b>Assignments and Activities</b>  |
|---|--|
| 1. Identify and apply the fundamental concepts and methods of a discipline or interdisciplinary field exploring the scientific world, including, but not limited to: computer science, history of science, life and physical sciences, linguistics, logic, mathematics, psychology, statistics, and technology related studies. | Students will gain an understanding of basic concepts in biology such as levels of organization of organisms (molecules, cells, tissues, organs, systems), functioning of cells, cell division, photosynthesis and genetics. Students will learn about the scientific method and will apply it in various hands-on exercises that include direct and indirect measurement, microscopy, biochemical assays and dissections (earthworm, locust, fetal pig). <b>These activities will be performed in the co-requisite BIO 109 laboratory course</b>  |
| 2. Demonstrate how tools of science, mathematics, technology, or formal analysis can be used to analyze problems and develop solutions.   | Students will learn the theory of the scientific method. They will then work in teams of two or four on various laboratory-based investigations. During their lab investigations, they will make scientific observations, collect data and analyze results collaboratively. They will present their findings in lab reports. <b>These lab-based activities will be performed in the co-requisite BIO 109 laboratory course. Some problem analysis and solution development will be carried out in BIO 108 in class lectures and homework assignments (for example, students will learn how to apply the Punnett square to understand basic genetics)</b> |
| 3. Articulate and evaluate the empirical evidence supporting a scientific or formal theory.   | Data gathered in lab sessions will be analyzed and presented in lab reports. Lab reports will follow the conventional format of introduction, materials and methods, results, discussion and conclusion. These reports will indicate students' understanding of scientific theories and their ability to articulate these  |

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|  |   |
|--|---|
|  | theories. <b>These lab-based activities will be performed in the co-requisite BIO 109 laboratory course.</b>  |
| 4. Articulate and evaluate the impact of technologies and scientific discoveries on the contemporary world, such as issues of personal privacy, security, or ethical responsibilities. | Students will learn about various technologies and scientific discoveries such as DNA fingerprinting, cloning, stem cells and cancer, and gene therapy. The impact of these will be discussed in class and students' understanding of these techniques and discoveries, and their impact on the contemporary world will be assessed by exams and homework assignments |
| 5. Understand the scientific principles underlying matters of policy or public concern in which science plays a role.  | Students will learn about issues such as global warming, pollution, genetically modified foods, stem cells and cancer, and will understand and discuss the scientific principles underlying these.  |

**Required Text:**

Custom Loose leaf: Phelan *What is Life?* 4e + 12M LaunchPad Access Card  
 ISBN-10: 1319232337  
 ISBN-13: 9781319232337, \$90 at the bookstore

Launchpad only: Ebook and resources \$55, follow the link your instructor will give you.

Launchpad is required.

**Other Resources** \_\_\_\_\_

**Use of Technology:** Launchpad and Blackboard

**Evaluation & Requirements of Students**

1. Objective & essay examinations including a final examination.
2. Writing assignments and/or oral presentations.
3. Attendance according to school policy.

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### LECTURE SYLLABUS

| Week   | Topic  | Text section   |
|--------|--|--|
| 1,2    | <b>NATURE OF SCIENCE AND CHARACTERISTICS OF LIFE</b><br>- Scope/Organization of Life<br>- Characteristics of Living things including: Organization, Homeostasis, Energy requirements, Growth, Sensitivity, Motility, Reproduction<br>- Nature of Science/Scientific Method<br>- Classification-Taxonomy<br>- How Evolution Works<br>- Origin of the Universe /History of Life on Earth | Ch. 0 (e-version on Launchpad only)<br><br>Ch 1<br>Ch 0<br>Ch 0, Ch 8<br>Ch 10 |
| 3, 4   | <b>CHEMISTRY OF LIFE</b><br>- Matter, Elements and Atomic Structure<br>Chemical bonding, water, acids & bases<br>- Molecules of Life-Carbohydrates, Lipids, Proteins, Nucleic Acids  | Ch. 2  |
| 5, 6   | <b>CELL/STRUCTURE AND INTERNAL COMPARTMENTS</b><br>- Prokaryotic and Eukaryotic Cells<br>- Eukaryotic Cells/ Structure & Function<br>- Cell Membrane, Organelles (including Photosynthesis & Cell Respiration- briefly)**<br>- Cytoskeleton  | Ch 3   |
| 7      | <b>CELL MEMBRANES &amp; TRANSPORT</b><br>- Membrane Transport  | Ch 3   |
| 8      | <b>CELL DIVISION</b><br>- Cell Cycle<br>- Chromosomal Organization<br>- Mitosis, Meiosis, Cytokinesis<br>- Stem Cells and Cancer   | Ch 6   |
| 9      | <b>PATTERNS OF INHERITANCE</b><br>- Mendelian Genetics<br>- Different types of Inheritance: Incomplete Dominance, Multiple Alleles<br><b>HUMAN GENETICS</b><br>- Pedigrees, Sex-linkage  | Ch 7   |
| 10     | <b>The STRUCTURE &amp; FUNCTION OF DNA</b><br>- DNA Structure<br>- DNA Replication   | Ch. 5  |
| 11     | <b>FROM GENE TO PROTEIN</b><br>- Protein synthesis: transcription and translation<br>- Mutation<br>- Gene Regulation   | Ch 5   |
| 12, 13 | <b>DNA TECHNOLOGY</b><br>- Genetic Engineering / Recombinant DNA<br>- Fingerprinting, Cloning, Gene Therapy, Ethical Issues  | Ch. 5  |
| 14     | <b>ECOLOGY</b>   | Ch. 15, 16   |

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BMCC is committed to the health and well-being of all students. It is common for everyone to seek assistance at some point in their life, and there are free and confidential services on campus that can help.

**Single Stop** [www.bmcc.cuny.edu/singlestop](http://www.bmcc.cuny.edu/singlestop), room S230, 212-220-8195. If you are having problems with food or housing insecurity, finances, health insurance or anything else that might get in the way of your studies at BMCC, come by the Single Stop Office for advice and assistance. Assistance is also available through the Office of Student Affairs, S350, 212-220- 8130.

**Counseling Center** [www.bmcc.cuny.edu/counseling](http://www.bmcc.cuny.edu/counseling), room S343, 212-220-8140. Counselors assist students in addressing psychological and adjustment issues (i.e., depression, anxiety, and relationships) and can help with stress, time management and more. Counselors are available for walk-in visits.

**Office of Compliance and Diversity** [www.bmcc.cuny.edu/aac](http://www.bmcc.cuny.edu/aac), room S701, 212-220-1236. BMCC is committed to promoting a diverse and inclusive learning environment free of unlawful discrimination/harassment, including sexual harassment, where all students are treated fairly. For information about BMCC's policies and resources, or to request additional assistance in this area, please visit or call the office, or email [olevy@bmcc.cuny.edu](mailto:olevy@bmcc.cuny.edu), or [twade@bmcc.cuny.edu](mailto:twade@bmcc.cuny.edu). If you need immediate assistance, please contact BMCC Public safety at 212-220-8080.

**Office of Accessibility** [www.bmcc.cuny.edu/accessibility](http://www.bmcc.cuny.edu/accessibility), room N360 (accessible entrance: 77 Harrison Street), 212-220-8180. This office collaborates with students who have documented disabilities, to coordinate support services, reasonable accommodations, and programs that enable equal access to education and college life. To request an accommodation due to a documented disability, please visit or call the office.

### **College Attendance Policy**

At BMCC, the maximum number of absences is limited to one more hour than the number of hours a class meets in one week. For example, you may be enrolled in a three-hour class. In that class, you would be allowed 4 hours of absence (not 4 days). In the case of excessive absences, the instructor has the option to lower the grade or assign an F or WU grade.

### **BMCC Policy on Plagiarism and Academic Integrity Statement**

Plagiarism is the presentation of someone else's ideas, words or artistic, scientific, or technical work as one's own creation. Using the idea or work of another is permissible only when the original author is identified. Paraphrasing and summarizing, as well as direct quotations, require citations to the original source. Plagiarism may be intentional or unintentional. Lack of dishonest intent does not necessarily absolve a student of responsibility for plagiarism. Students who are unsure how and when to provide documentation are advised to consult with their instructors. The library has guides designed to help students to appropriately identify a cited work. The full policy can be found on BMCC's Web site, [www.bmcc.cuny.edu](http://www.bmcc.cuny.edu). For further information on integrity and behavior, please consult the college bulletin (also available online).

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**IF LOST PLEASE CONTACT:**

**STUDENT NAME:** \_\_\_\_\_

**STUDENT CONTACT INFORMATION:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**NAME, ADDRESS & TELEPHONE NUMBER / EMAIL OF CLASSMATES:**

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**DATES, TIMES, LOCATIONS FOR STUDY GROUPS:**

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