Lamar University
College of Arts and Sciences

Fall 2014

Department: Biology

Course Number/Section: BIOL 1406/01

Course Title: General Biology I

Credit Hours: 4.0

Professor: Dr. Randall Terry
Hayes Building 205-8
Phone: 880-7975
E-mail: rgterry@lamar.edu
Office Hours: T 2:15-4:00
R 2:15-4:00

Class Meeting: Science Auditorium; T, R 9:35-10:55

Course Description:
A survey of organisms, molecules, cells, tissues, photosynthesis, genetics, and evolution. Offered: Fall, Spring, Summer

Required/Optional Texts and/or Course Materials:
Required Text:

Course Outcomes:
Learning Outcomes:
Following this course students will be able to:
1. Describe the characteristics of life.
   a. list at least eight features shared by all living things.
2. Explain the reasoning used by scientists.
   a. list the components of the scientific method and describe how they relate to one another as part of a broader problem-solving process.
3. Identify the basic properties of substances needed for life.
   a. describe functional and structural characteristics of biological macromolecules.
4. Compare and contrast the structures, reproduction, and characteristics of prokaryotic cells and eukaryotic cells.
5. Describe the structure of cell membranes and the movement of molecules across a membrane.
6. Identify the substrates, products, and important chemical pathways in metabolism.
   a. describe the role of enzymes as catalysts and tell how enzyme activity is regulated in the cell.
7. Identify the chemical structures, synthesis, and regulation of nucleic acids and proteins.
   a. describe fundamental biochemical processes of the cell including:
      i. transcription
      ii. translation
      iii. DNA replication
      iv. regulation of gene expression
8. Compare and contrast mitosis and meiosis.
9. Identify the principles of inheritance and solve classical genetic problems.
   a. understand the principles of Mendelian inheritance and solve inheritance problems using Punnett squares and probability.
11. Describe the unity and diversity of life.
   a. list Whittaker’s five kingdoms and describe the features of organisms included within the various kingdoms.

Core Curriculum Objectives:

Life and Physical Sciences:
Courses in this category focus on describing, explaining, and predicting natural phenomena using the scientific method. Courses involve the understanding of interactions among natural phenomena and the implications of scientific principles on the physical world and on human experiences.

I. Core Curriculum Objectives (Life and Physical Sciences):
   a. Critical Thinking Skills: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information.
   b. Communication Skills: to include effective development, interpretation and expression of ideas through:
      i. written
      ii. oral
      iii. visual communication.
   c. Empirical and Quantitative Skills: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions.
   d. Teamwork: to include the ability to consider different points of view and to work effectively with others to support a shared purpose or goal.
Course Activities Cross-Referenced to Core Curriculum Objectives
1. Students will receive instruction and answer on theories addressing the origin of life. (CCO Ia - Critical Thinking Skills)

2. Students will identify the principles of inheritance and solve classical genetic problems. Students will answer embedded examination questions. (CCO Ic - Empirical and Quantitative Skills)

Assessment of the remaining core objectives will take place in the laboratory component of the course. Students must be concurrently enrolled in lecture and lab sections for this course.

Classroom Management Policies:
Accommodations
Students needing an accommodation based on the impact of a disability should contact me privately to discuss specific needs. Accommodations will be coordinated by the Office of Services for Students with Disabilities (Wimberly Bldg., Room 101; Phone 880-8347) pursuant to federal and state laws and the university policies promoting equal educational opportunities.

Academic Dishonesty
Procedures addressing academic dishonesty are included in the Student Handbook. Academic dishonesty includes copying another student’s work, plagiarism, and collusion. Students engaging in these activities will be assigned an “F” for the course and can be reported to the appropriate university authorities.

Attendance
Attendance is not included as a basis for grading, however active participation is required to successfully complete the course.

Dropping the Course
• In accordance with University policy, the last day to drop the course without penalty (you will receive a Q or W, regardless of your current grade) is **Monday, October 1**.
• The last drop day is **Monday, November 5**. If you drop during the period from October 2 to November 5 you will receive a Q or W if your current average is 60% or higher, or an F if your current average is less than 60%. Drop request after this date will be denied unless due to an unforeseen and documented serious life disrupting event. See the departmental secretary in Rm. 101 of the Hayes Biology Bldg. for the required drop forms.

Grading and Evaluation:
Grading

- Seventy-five percent (75%) of the final grade comes from lecture, 25% comes from lab.
  - Lecture Component
    - There will be four lecture exams. Each is worth 100 pts. for a total of 400 pts. The last lecture exam will be given in the final exam period but is not comprehensive.
  - Lab Component
    - There will be three laboratory tests given throughout the semester.

The grading scale on a percentage basis is as follows: 90-100 = A; 80-89 = B; 70-79 = C; 60-69 = D; 0-59 = F.

- Extra Credit: No extra credit points are available.
- Make-up Exams: You must petition the instructor before the regular exam is given to be considered for a make-up exam. Only university-sponsored events and extenuating circumstances of a serious nature will be considered.

Course Outline:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Assigned Reading</th>
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<tbody>
<tr>
<td>8/28</td>
<td>Introduction</td>
<td>Chapter 1 (1-18)</td>
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<tr>
<td>8/30</td>
<td>Introduction con’t.</td>
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<tr>
<td></td>
<td>Inorganic Chemistry</td>
<td>Chap. 2 (all)</td>
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<td></td>
<td>Oxidation-Reduction and Electron Transport Chains</td>
<td>Also 164-167</td>
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<tr>
<td>9/4</td>
<td>Inorganic Chemistry-Redox con’t.</td>
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<td></td>
<td>Water</td>
<td>Chapter 3 (all)</td>
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<tr>
<td>9/6</td>
<td>Macromolecules</td>
<td>Chap. 5 (all)</td>
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<tr>
<td>9/11</td>
<td>Macromolecules cont.</td>
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<tr>
<td>9/13</td>
<td>Cell Biology</td>
<td>Chap. 6 (94-118)</td>
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<tr>
<td>9/18</td>
<td>Cell Biology con’t</td>
<td>Chap. 7 (all)</td>
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<tr>
<td>9/25</td>
<td>An Introduction to Metabolism</td>
<td>Chap. 8 (all)</td>
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<td>9/27</td>
<td>Metabolism con’t</td>
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<td>Cellular Respiration</td>
<td>Chap. 9 (all)</td>
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10/2   Cellular Respiration con’t.

10/4   Photosynthesis   Chap. 10 (184-199)

10/9   Photosynthesis con’t.

10/11   The Cell Cycle; Mitosis   Chap. 12 (all)
         Meiosis   Chap. 13 (all)

10/16   Exam II (*Covers Metabolism through Photosynthesis Inclusive*)

10/18   Meiosis con’t.
         Mendelian Genetics   Chap. 14 (all)

10/23   Mendelian Genetics con’t.

10/25   Chromosomes and Inheritance   Chap. 15 (286-300)
         Transcription and Translation   Chap. 17 (all)

10/30   Transcription and Translation con’t.;

11/1    Regulation of Gene Expression   Chap. 18 (351-364)
         in Prokaryotes

11/6    Darwinian Evolution   Chap. 22 (all)
         Population Genetics and Speciation   Chap. 23 (all)
         Chap. 24 (all)

11/8    Exam III (*Cell Cycle –Gene Expression Inclusive*)

11/13   Population Genetics and Speciation con’t.

11/15   Population Genetics and Speciation con’t.

11/20   The History of Life on Earth Chapter 25 (58-59; 507-525)
         Overview; Origin of Life, Origin of Photosynthesis

11/27   History of Life con’t.
         Origin of Eukaryotes; Origin of Multicellularity

11/29   Origin of Land Plants; Origin of Animals

12/4    History of Life con’t.

TBA    FINAL EXAM